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THE MANAGEMENT OF DECUBITUS ULCERS IN THE PARAPLEGIC.

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PRIOR to the advent of World War II the lot of the paraplegic was indeed grim. He was considered to present the classic example of a hopeless case, and as such was neglected and left to fend for himself as best he might. Little wonder, therefore, that his morale was low and his expectation of life short.

Remarkable indeed has been the changed outlook since the formation of teams and centres to look after these unfortunate people—an interest given special impetus by the casualties of World War II. The experience gained in the treatment of these war victims is now bearing fruit also with the injuries of civilian life.

So recent has been the awakening to the fact that the condition of these patients is not hopeless, that it was not until 1945 that the literature recorded a surgical attempt to close a decubitus ulcer (Lamon and Alexander, 1945).

Ætiology.

No doubt exists that decubitus ulcers are due to pressure and resulting gangrene of the affected parts, though Charcot's theory that they were entirely trophic in origin died hard.

Trumble (1930) carried out experiments to determine skin tolerance to pressure. He found, as might have been expected, that continuous pressure was very serious, and that a small pressure for a long period had much the same effect as a large pressure for a short period.

The following factors (Battle, 1948) play a contributory part: (i) immobility of the patient; (ii) loss of sensation below the level of the lesion; (iii) vasomotor paralysis, especially in high lesions; (iv) bony prominences, notably the sacrum, ischia, trochanters and calcanei; (v) the general nutritional state of the patient—an anæmic, hypoproteinæmic patient falls a ready victim.

Incidence.

Conway *et alii* (1947) reviewed 298 cases of decubitus ulcer and found the following distribution: on the anterior superior iliac spines, 6%; on the knees, 8%; pretibial, 4%; trochanteric, 19%; malleolar, 1%; calcaneal, 19%; sacral 21%; ischial, 10%; miscellaneous, 12%. These figures are typical of the "bad old days", when the majority of patients were bedridden and sores occurred on any bony prominence.

Four years later, Blocksma, Kostrubala and Greeley (1949) in 334 operations found the following distribution: ischial, 178 (53·2%); trochanteric, 90 (27%); sacral, 60 (18%); other sites, 6 (1·8%). The completely changed incidence shows clearly the improved outlook for the paraplegic, and indicates the increasing mobility of these patients, ischial sores outnumbering all others put together. This is due to the fact that the patient spends most of his time on his ischial tuberosities, either in a wheel-chair or walking in calipers. It should be noted here that ischial-bearing, ring-top calipers should be avoided whenever possible, and either the bucket-top or band-top types used instead.

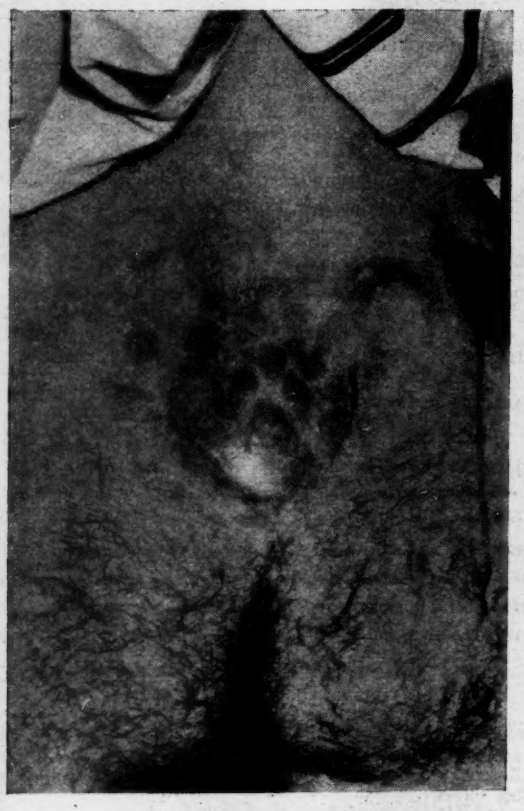

FIGURE I.

A sacral bedsore healed by the use of a free graft in the form of postage stamps. This has proved entirely stable for over two years.

With proper care and management it should be possible to eliminate sacral and trochanteric ulcers completely. They are the result of inadequate treatment. Other miscellaneous pressure ulcers come into the same category, and only ischial ulcers should in future require treatment. Even these are avoidable with proper care and education of the patient.

This paper will deal only with the management of sacral, ischial and trochanteric ulcers.

Pathology.

Once an ulcer has occurred, the hazards of infection and toxicity are added and it becomes a danger to life. This is even more serious in the presence of poor general nutrition. Poer (1946), using the method of Mulholland *et alii* (1943), showed that large quantities of protein could be lost from an ulcer, some patients losing as much as 50 grammes of protein per day.

Thus a vicious train of pressure, ulceration, infection, toxicity, loss of protein, hypoproteinæmia and poor general nutrition is set up. Unless this course is arrested, death is not long in following.

The blood supply to the skin is better than that of the subcutaneous tissues, and this accounts for the often seen small skin sinus leading to an enormous cavity beneath, with wide undermining, usually with exposed bone in the floor.

Blocksma, Kostrubala and Greeley (1949) found that in 75·9% of cases there was osteomyelitis or degeneration and fibrosis of the underlying bone.

The most sinister sore from this point of view is that on the ischium. Here one classically sees the small external opening with the large subcutaneous sac. Those unaware of the possibilities are lulled into a false sense of security by the small external opening, and no serious import is accorded it.

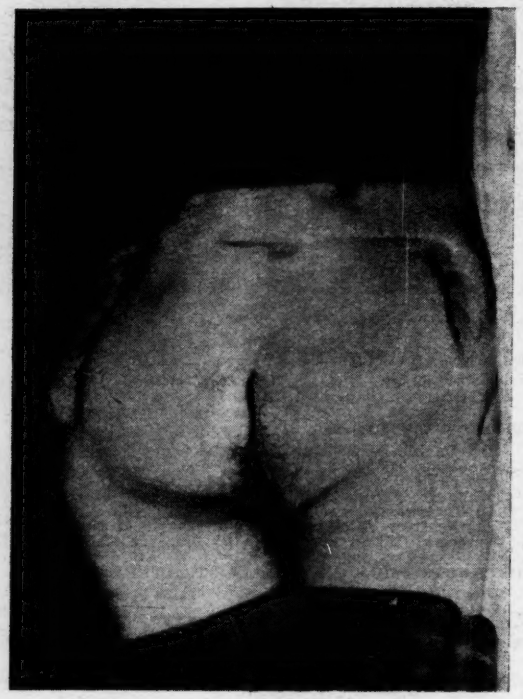

FIGURE II.

A sacral sore closed with two transposed buttock flaps. Note the split skin grafts placed laterally in order to avoid tension on the flaps; they are clear of pressure points.

If this occurs, osteomyelitis of the ischium follows, accompanied by profound septic absorption and a corresponding grave effect on the general health of the patient. In addition, the infection spreads along the bone, tending to travel more laterally than medially, soon reaching and involving the hip joint, with resulting septic arthritis and at the best a stiff hip. To these people, even if they survive, this is a disaster of the first magnitude.

Prophylactic Treatment.

Prophylactic treatment may be set out briefly as follows.

1. Maintenance of the general health of the patient. A protein-rich diet with extra vitamins *A*, *B*, *C* and *D* is essential for the well-being of these patients. If they already have an ulcer on their admission to hospital, their negative nitrogen balance must be corrected forthwith.

2. Maintenance of the hæmoglobin level at a minimum of 12 grammes *per centum* and the red cell count at 4,000,000 per cubic millimetre. Whole blood transfusions have wide application and are freely used.

3. Care of the bowels and bladder. Full details of bowel and bladder care do not come within the scope of this paper. Suffice it to say that the bowels must be kept regularly open by periodic enemas, and urinary infection must be rigidly avoided.

4. Care of the skin. Continuous pressure on the same area will produce a pressure sore. The paralysed patient must therefore be turned every two hours, day and night, in order to obviate this, his position alternating from back to right side, to back, to left side. Frequent back toilets produce only moist conditions conducive to infection. They are unnecessary and are to be condemned. A

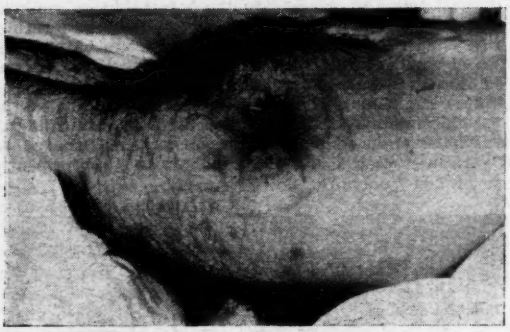

FIGURE III.

Trochanteric ulcer, which had healed spontaneously, but was paper thin and unstable.

daily wash with soap and water, and careful drying and powdering are all that is required. Wet or damp bedclothes must be changed immediately and the patient kept dry at all costs. Strong antiseptic lotions also are unnecessary and may be harmful.

Treatment of the Established Ulcer.

Many ulcers, if kept clean and free from pressure, will heal spontaneously and remain healed. However, it is important to obtain healing as soon as possible for the reasons already stated.

Dressings with eusol (1:8) three times a day will rapidly clean up the infection, and healing can frequently then be achieved by the use of a split skin graft. This procedure is very useful, especially in the care of sick patients, and is frequently all that is required for sacral sores, for with proper care no weight is taken on the sacrum. However, should this skin cover be insufficient or unstable, then flap repair can be undertaken on a clean area without risk of infection.

Ischial and trochanteric sores, however, are frequently grossly undermined, and healing cannot be obtained without excision of the ulcer.

The method advocated by Kilner *et alii* (1951) for preparing granulations for grafting has been used with great satisfaction by the writer This consists of eusol dressings three times a day for a few days and then packing the ulcer cavity with 1% streptomycin solution on gauze for three days prior to operation. The incidence of infection in operative wounds has been almost eliminated by this means. The only organisms which have proved troublesome are group A beta-hæmolytic streptococci and some occasional staphylococci, but all have so far been controlled by this regime. Bors and Comarr (1948) point out the minor role played by bacteria in these sores.

X-ray examination of the underlying bone should be carried out in all cases, and whenever there is any doubt as to the extent of the subcutaneous cavity it should be outlined with a little "Lipiodol" and radiologically examined.

The following criteria are necessary before operation is undertaken: (i) The patient must have a minimum hæmoglobin level of 12 grammes *per centum*. (ii) The patient must be thriving on a protein-rich diet of high caloric value. (iii) The ulcer must be commencing to heal spontaneously. (iv) No urinary infection must be present. (v) The ulcer must be clean locally, as outlined above. (vi) There must be no muscle spasms which will be liable to produce movement of the operation site and shearing of the graft on its bed. Anterior rhizotomy or neurotomy may be required at times to correct these spasms. This especially applies to the repair of ulcers over the greater trochanter.

Surgical Treatment of Decubitus Ulcers.

Lamon and Alexander (1945) were the first to report the closure of a paraplegic ulcer, previously considered a well-nigh impossible feat. Since this time many methods have been adopted.

Excision and direct suture have been used by many (Gibbon and Freeman, 1946; White, Hudson and Kennard, 1945; and others). This was soon shown to be inadequate, and recurrences were rapid.

Closure by flaps followed (White and Hamm, 1946; Conway *et alii*, 1947; Barker, Elkins and Poer, 1946; and many others), but in the early cases the flaps were too small, and too many suture lines met at the one spot, producing a weak area which soon broke down. It was

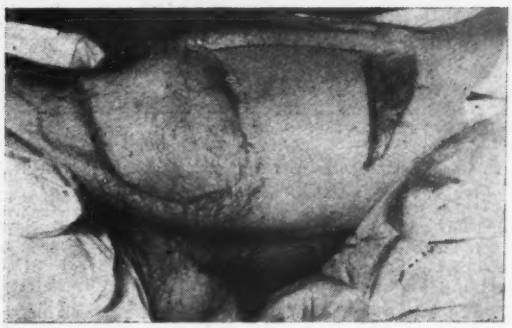

FIGURE IV.

Same ulcer as in Figure III, repaired by two transposed flaps. Usually one flap is sufficient, but this was a large defect when the old scar had been excised.

then realized that some of the causative factors remained and were responsible for recurrence, notably the bony prominences. Soon, therefore, excision of the ulcer and underlying bony prominence with flap repair was undertaken. This was a great advance and the basis of the present methods of repair (Kostrubala and Greeley, 1947; Blocksma, Kostrubala and Greeley, 1949; Conway *et alii*, 1947; Battle, 1948).

Excellent results were obtained with these methods. In fact, the pendulum has swung further, and Meloy and Harding (1946) now advocate prophylactic excision of the ischial tuberosities, the superior and inferior rami of the ischium and the inferior ramus of the pubis before an ulcer develops. This extreme of treatment would seem unnecessary.

The following principles must be adhered to, in order to achieve permanent skin cover which will meet the daily needs of the patient.

1. The ulcer must be excised *in toto*.

2. If the bony prominence is at all marked or is diseased, it should be removed and smoothed.

3. Hæmostasis must be absolute, and in these conditions, due to vasomotor paralysis, this is not easy to achieve. Diathermy coagulation (Bors and Comarr, 1948) is invaluable if used carefully and with a weak current. If improperly used, it will guarantee failure.

4. After all flap repairs drainage should be instituted for 48 to 72 hours, as there is always some post-operative oozing of blood and serum, and if this is not evacuated wound dehiscence will occur.

5. The wound should be repaired in layers without tension and with the finest sutures and instruments. Guttmann (1956) and other authors advocate the use of fine stainless steel wire, as being completely inert. If possible, the various layers of the wound should be staggered and interdigitated in order to avoid superimposition of suture lines.

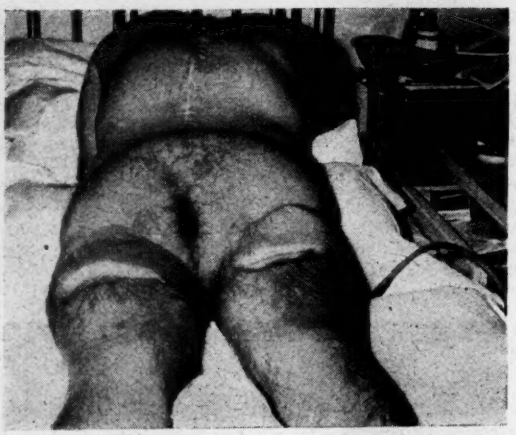

FIGURE V.

Bilateral ischial sores closed by transposed flaps from the posterior surface of the thighs.

6. Flap repair is preferable to direct suture. In this way a large depth of viable, healthy tissue is placed over the defect, and one is not left with a scar directly overlying an area which has to withstand pressure.

7. The site of repair should be kept free from pressure for at least four weks, in order to allow it to heal firmly before subjecting it to trauma.

8. Sutures should be left in for a minimum of 10 days, provided they are not infected or cutting in.

Repair of Sacral Ulcers.

When the local and general conditions for repair are propitious, skin cover can be undertaken. As was previously stated, split skin cover as a preliminary is extremely useful and may prove to be all that is required. Should this not be adequate, then flap repair must be carried out.

The ideal method of repair is by two rotation flaps from each buttock based distally (Battle, 1948), and with direct suture of the resulting defect. However, this ideal cannot often be achieved, since the tissues of these patients, owing to trophic changes, do not possess the elasticity normally found here, being thick, turgid and indurated. Local massage before operation can considerably improve tissue mobility. Direct closure of the donor area of the flap, therefore, is seldom possible without tension. The writer therefore prefers seldom to attempt this, but to cover the donor area with a split skin graft. This guarantees suture of the flaps in the mid-line without tension, and immeasurably increases the chances of success of the operation. Care is taken that the split skin graft is placed laterally in the buttocks in a non-pressure-bearing area, and no trouble has been experienced with this. This is the method preferred by Conway *et alii* (1947). Blocksma, Kostrubala and Greeley (1949) and others advocate the use of a large, delayed, transposed flap from the lumbar region crossing the mid-line. The idea is a good one, as one does not then have a scar overlying the sacrum, but healthy flap tissue. However, it suffers from the following disadvantages: (i) the donor area is in a potential area of breakdown; (ii) if a lumbar puncture needs to be carried out at a later date there is only a split skin graft as cover over the lumbar spines. Nevertheless, in many instances there is no doubt that this method provides a most satisfactory repair. These authors stress the importance of the removal of bony prominences, which they carry out as a routine, eliminating all the bony nodules on the dorsum of the sacrum. In thin patients or those with extreme prominence of the spines this is a very sound procedure.

Repair of Trochanteric Ulcers.

Trochanteric ulcers are frequently widely undermined, with a small skin opening. X-ray examination with "Lipiodol" delineation of the cavity is therefore always called for. Closure by free graft is thus usually not possible. Excision is therefore necessary, and the method of "pseudotumour" removal advocated by Guttmann is used whenever possible. This consists in packing the cavity tightly on the operating table with gauze, suturing the skin opening, and excising the sac and its gauze contents. This ensures a sterile procedure. However, with extensive undermining of the skin this is not practicable, and it is often necessary to introduce one's finger into the sac in order to define its limits.

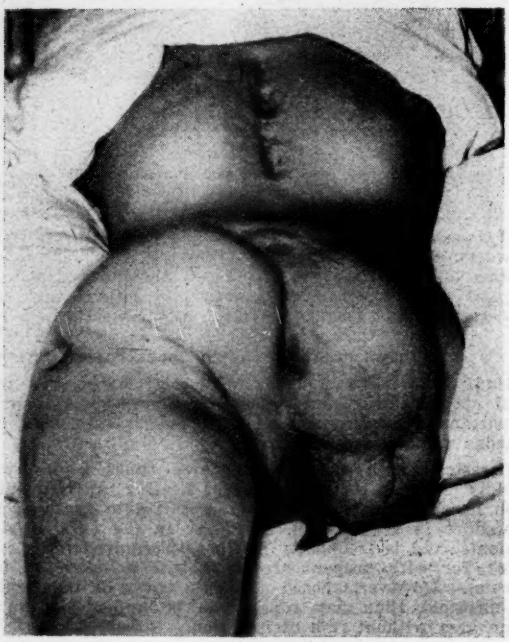

FIGURE VIII.

The result of a neglected ischial sore—disarticulation of the hip. A recurrent sore even after this recently required repair, as may be seen.

The writer is in agreement with most authors regarding the removal of the greater trochanter with an osteotome. This not only removes the bony prominence, making repair much easier, but gives a good base to which the flaps may adhere.

Closure by a transposition flap based anteriorly on the thigh is the most convenient method of skin cover. In

this region most particularly, flexor spasms are a contra-indication to operation, as shearing of the graft occurs and wound breakdown is inevitable. Hæmatoma is common here for the same reason.

These lesions, as has been explained earlier, particularly with regard to ischial sores, may have the most serious consequences if vigorous treatment is not instituted. Osteomyelitis of the greater trochanter, if allowed to progress, may extend into the hip joint, producing septic arthritis. Disarticulation of the hip may be called for as a life-saving procedure in these cases. However, Guttmann advises this only as a last resort, and institutes free drainage, meanwhile building up the general nutrition and health of the patient. He holds that on this regime the infection will subside in most instances.

Repair of Ischial Ulcers.

As the outlook for paraplegics improves, and as they become more mobile, more and more time is spent weight-bearing on the ischial tuberosities. Should the patient not be "sore-conscious", an ischial sore is likely to occur. As a result, greater numbers of these ulcers are being seen. They are the most dangerous of all ulcers, as usually a small skin defect leads to a large subcutaneous cavity associated frequently with bony infection of the ischium. In these cases, therefore, X-ray examination is required as a routine procedure, to determine whether or not there is infection in the bone, and, in addition, "Lipiodol" should be run in to delimit the cavity.

Repair consists in excision of the sinus and underlying cavity. If the bone is diseased, it should be widely excised. This is the only way in which one can adequately deal with the bony infection. As Osborne (1956) has shown, this is not a difficult procedure. It is best carried out with large double-action forceps, such as laminectomy forceps. A Gigli saw is not necessary; it is in fact more difficult to use, and is more likely to damage the skin edges.

Closure of the soft tissues after this is usually simple, and skin cover is obtained by a transposition flap from the posterior surface of the thigh. If the bony infection has been present for a long time, then ossification in the soft tissues may be widespread. This makes repair extremely difficult and breakdown of the wound more likely. The hips should be well flexed during the closure, in order that all tension should be eliminated, and that the patient may be able later to sit up and flex the hips without putting too great tension on the wound. When possible, a flap of muscle from the gluteus maximus should be swung over to aid in soft-tissue closure, as advocated by Kostrubala and Greeley.

Weight-bearing is not allowed for at least a month after healing has occurred, and should be preceded by grease massage to scars in order to aid in mobilizing and softening them.

Results.

White and Hamm (1946) quote 14 cases, in which complete healing occurred in six, partial healing occurred in six, and two were failures.

Gibbon and Freeman (1946), in 65 cases, obtained 67·7% complete healing, 15·7% delayed healing, 8% of improvement, 8% failures and 1·5% deaths.

Conway *et alii* (1947) obtained a cure rate of 71%, with 29% recurrence or persistence.

In the present series a total of 29 operations have been carried out on 23 ulcers in 16 patients. These comprised 12 ischial ulcers, six sacral ulcers and five trochanteric ulcers. As was previously stated, this underlines the increasing importance of ischial sores.

Four ischial ulcers recurred before the importance of removing infected and prominent bone was realized. These patients have since had a further operation and the offending bone removed. All the wounds are now healed and stable.

One ischial ulcer broke down owing to post-operative hæmatoma and a further operation was required.

One trochanteric ulcer broke down owing to severe post-operative flexor spasms, and a further operation was required. A post-operative hæmatoma occurred with this procedure, and a small sinus still persists.

Thus 17 out of 23 decubitus ulcers were closed successfully with one procedure and have remained healed. Six required a second procedure and, of these, one remains unhealed, though greatly improved. One other trochanteric ulcer remains as a small defect.

A total of 21 of the 23 ulcers are healed and stable. There were no deaths.

Conclusion.

All patients with spinal cord injuries should be admitted direct to spinal centres as soon as possible after the injury. Inexperienced though well-meant treatment in the early stages may be disastrous.

Pressure sores are not inevitable, and with proper nursing and meticulous attention they can be avoided. The patient should be made aware of the situation and encouraged to become "sore-conscious". If these ideals are attained, decubitus ulcers can be entirely eliminated, and in future it is hoped that they will be recalled only as reminders of the "bad old days".

Summary.

1. The incidence of paraplegic ulcers formerly and at present is discussed.

2. The principles of management are discussed.

3. The prophylactic treatment is considered.

4. The surgical treatment of established ulcers is described.

5. The results of the present series are enumerated.

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ILLNESS IN TWINS: VI. SARCOIDOSIS.

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THE previous papers of this series have dealt solely with twins found in consecutive hospital in-patients (Doig and Pitman, 1957; Doig, 1957 *a*, *b*, *c*; Pitman, 1958). During such a study it is inevitable that twins should be referred who are in no way part of a definite group. In this investigation most of such twins came from the Out-patient Clinic of the Clinical Research Unit of the Royal Melbourne Hospital; unfortunately, a complete survey of this group proved to be impossible. In all 23 twins and 13 co-twins were studied, six co-twins having died at birth or in infancy, and two in adult life. Information about one co-twin was by letter only, and no information was available about the remaining co-twin. Of the 23 twins, eight were identical pairs, three of whom were confirmed by blood group, six were fraternal pairs of the same sex, and eight were of opposite sex.

Of the identical twins, concordance was seen in six pairs. A male pair, aged 57 years, had a history of duodenal ulcer in each twin, with gastro-jejuno-colic fistula after gastro-enterostomy in one, and with hæmorrhage and perforation in the other. Another male pair, aged 25 years, had indirect inguinal herniæ. Both of a pair of boys aged three years had bilateral congenital dislocation of the hip. The co-twin of another identical male pair had been killed in the war. The index twin suffered from pancreatitis. Two females, aged 38 years, had congenital mental deficiency. Identical girls, aged seven years, had congenital megaureter with vesico-ureteric reflux. This pair and a discordant dizygous pair have been recorded by Stephens, Joske and Simmons (1955). The other concordant female pair had sarcoidosis. The index twin of the discordant pair was 70 years old when seen, and she had symptoms of pancreatitis. Both twins had been healthy till the death of the co-twin at the age of 66 years with carcinoma of the pharynx.

The purpose of this paper is to record the concordant appearance of sarcoidosis in identical twins aged 27 years. This is done with a full awareness of the limited value of such a report, but with the hope of stimulating a more complete survey of the twin and family incidence of sarcoidosis in a larger collection of patients. The familial occurrence of a disease or its concordant appearance in identical twins is often hailed as evidence of a genetic origin. In reviewing the evidence for a "family" factor in sarcoidosis, we hope to show that such a survey could provide pointers in the elucidation of the nature of sarcoidosis.

Report of Twin Cases.

Index Twin.

This patient was first seen by one of us (H.I.J.) in December, 1954, with symptoms of tiredness and of a lump in the left side of the abdomen. Her original symptoms started in August, 1948, with a cold, which persisted for two months. In November she had a swollen right ankle and "lumps" on her leg. These lumps were described as about the size of a bean, and they were not tender. She was referred to a hospital in Hobart for investigation, and she was told that she did not have tuberculosis. Hilar lymph node enlargement was apparent on radiography. In December the patient came to Melbourne. In the same month she consulted Dr. W. Counsell with a red eye and photophobia. She was told it was iritis and treated with atropine drops. The symptoms disappeared after six months. The diagnosis of sarcoidosis was thought to be highly probable at the time.

A few months later she noted that her health was not good: she had no energy, was dyspnœic on exertion and was depressed, and these feelings became more disturbing. In 1951, enlarged lymph glands were found and an inguinal gland biopsy led to a definite diagnosis of sarcoidosis. Non-tender lymph gland enlargement has continued to a variable degree ever since. Other symptoms included transient hæmaturia, pruritus and amenorrnœa. Her lack of energy increased, and she had some dyspnœa on effort. The latter symptom increased late in 1954, when she developed a slight irritating cough. In November, 1954, she noted a lump under the left rib margin and attacks of pain, which she related to the lump. She had been troubled by a recurring rash for three years. She eventually attended the Out-patient Department at Prince Henry's Hospital, Melbourne.

Examination of the patient at this stage gave the following information. Her weight was nine stone 10 pounds. The cervical and left axillary lymph nodes were enlarged. An irregular pink rash and pigmented areas were present on both thighs and shins, behind the right ear and on the left temple. The inguinal biopsy scar was involved. The spleen and liver were both enlarged, the former almost to the umbilicus. There was a trace of ankle œdema. An X-ray examination of her chest showed diffuse fine nodular infiltration of both lungs with no evidence of hilar gland enlargement. A Mantoux test gave a negative result to 1:100 old tuberculin after 48 hours. The hands showed no abnormality radiologically.

She was admitted to the hospital on February 12, 1954, and a splenectomy was performed. There had been nothing to suggest hypersplenism, the indication for operation being the size of the spleen and the pain. Blood examination prior to splenectomy showed that the hæmoglobin value was 13·5 grammes per 100 millilitres, the white cell count was 2900 per cubic millimetre, platelets numbered 157,000 per cubic millimetre, and the erythrocyte sedimentation rate was 42 millimetres in one hour. The bleeding time was 80 seconds, and the prothrombin index was 65%. The direct Coombs test, Wassermann and Kahn tests gave negative results. The serum albumin content was 4·2 grammes per 100 millilitres, and the globulin content was 5·8 grammes per 100 millilitres, a cephalin flocculation test gave a +++ result. Urine examination and an intravenous pyelogram gave normal findings. The bone marrow showed increased normoblastic erythropoiesis. The serum alkaline phosphatase level was 64 units. Animal inoculation and culture for tubercle bacilli from the spleen gave negative results.

Dr. John Funder reported on the spleen as follows (Figures I and II).

> Spleen approximately 20 × 10 × 7 cm. The capsule is thin and shiny. The external surface shows flat nodular elevations up to 5 mms. in diameter. The cut surface shows nodules 1 mm. or so in diameter, singly or in groups, against a pink background. On microscopic examination the splenic substance is largely replaced by tubercle-like follicles comprised mainly of multinucleated giant cells and epithelioid cells. No caseation necrosis is seen. "Asteroid" inclusions were present in many giant cells. The histological picture was typical of sarcoidosis throughout the spleen.

Since operation she has continued to feel much better. Her weight decreased to eight stone 10 pounds in May, 1955, comparing favourably with her weight of eight stone six pounds in December, 1948. Her depression lifted; her energy improved and her respiratory reserve approached normal. The erythrocyte sedimentation rate and serum protein content returned to normal. The patient and her husband left Melbourne in August, 1956, and to that time, apart from an operation for varicose veins, she had remained well. She was given no antibiotics or steroid therapy.

Some further aspects of this patient's history are worth comment. She has suffered from migraine for a long time, the onset possibly being about the menarche. The attacks are preceded by a few minutes of visual disturbance. The pain is initially retrobulbar, then frontal and vertical, mild in degree and throbbing in character. The scalp is tender. Attacks occur premenstrually, or on the first or second day, or when she is "nervy". One occurred with the excitement of going home from the after-care hospital. The patient has always had very dark circles under her eyes. These are worse with headaches: but they have become much less evident since the operation.

The patient has had severe dysmenorrhœa. Menarche occurred at the age of 12 years: she was told nothing about menstruation at the time, and she was shocked and uncomfortable. For several days of her period she has severe pain, and is often in bed with uselessness of the hips and lower limbs. These symptoms have decreased steadily over the last few years. The patient married in 1948, and

[1] Aided by a grant from the Nuffield Foundation.

since then she has had three miscarriages. She stated that she had no sexual feeling at first, but that intercourse is now satisfactory to her. Her husband's brothers and sister are married and have children, and her husband is healthy. The cause of her infertility is unknown.

Other events in her medical history include *otitis media* at the age of 17 years, and appendicitis at 18 years. Her varicose veins had been noticed for 10 years.

Co-twin.

The co-twin when seen on several occasions was a healthy looking young woman with the same very dark circles under the eyes. She had had mumps, measles, and infectious hepatitis, but not appendicitis. Some time after she had been seen by us she was submitted to a laparotomy for "acute abdomen", and a right ovarian cystectomy and appendicectomy were performed. Like her sister she suffered from dysmenorrhœa with pain before and after the onset of her period. She has suffered from migraine for more than two years, visual symptoms occurring at the onset and vomiting at the offset. Sexual intercourse had only lately been satisfactory to the patient; and earlier in her marriage she had suffered from dyspareunia. Over five years of marriage she had not become pregnant. Pelvic examination showed that she had a small uterus, while her husband had a reduction in sperm count. She also had varicose veins for which she had undergone an operation. She had not lived with her twin sister for eight years, but had seen her on the average of once a month. The patient was examined at Prince Henry's Hospital, Melbourne, in March, 1955. Apart from the above-mentioned complaints she complained of intermittent dyspnœa on exertion, especially after meals, tiredness and "tightness" in the throat on eating. The spleen was readily palpable on inspiration, and the thyroid was slightly enlarged. Otherwise physical examination revealed no abnormality. An X-ray examination of her chest showed bilateral hilar lymph gland enlargement. The lung fields were normal.

A Mantoux test gave negative results to 1:10 old tuberculin. Her full blood count was normal apart from a leucopenia. The erythrocyte sedimentation rate and serum protein content were normal. Although a biopsy was not made, it was thought that sarcoidosis was a reasonable diagnosis.

The twins showed a striking likeness in physical appearance, although this could be lessened by differences in their hair style and dressing. Both belonged to blood group A, Rh positive. No further checks of identity were made.

Family History.

The father was about 55 years old when the twins were seen in 1955. He had had a cerebral thrombosis two years earlier, and has had rheumatoid arthritis for 30 years. He is a farmer, and he came from a large family ruled by a strict father. Despite his disability he worked hard. Discipline was enforced by a strap or by arousing pity for his pain. The index twin stated that related to this she has had great difficulty in expressing anger at anyone for fear of hurting them, and it is only since the time of her marriage and with her husband's encouragement that she has gained more self-confidence and self-assertiveness. A sister and half-sister of the father have died of tuberculosis, and another sister has had sanatorium treatment. Neither father nor mother suffered from chronic cough.

The mother was 55 years old when the twins were seen. She had had a hysterectomy two years before. Apart from that she has been well. Since her family has grown up she has become more active on the farm and in her social life.

The twins are the third born in a sibship of six. All the others are well. The older brother and sister and the youngest sister are single. All the family except the youngest (and the interval between sibs is nine years in her case) are shy, which the twins relate to growing up on an isolated farm.

Both twins commenced training as nursing aides. This was interrupted by marriage for the index twin, and by an unsatisfactory affair for the co-twin. The two sisters are quiet by nature and depend a lot on their husbands and on each other. The husband of the index twin was not in Melbourne for some months before her splenectomy; this was undoubtedly a factor in her depression and loss of confidence. The co-twin, who was the "stronger" in childhood, denied that she was recognizably nervous. However, she gave a past history of brief nervous breakdown at the age of 12 years; and she agreed that her sister's illness had caused her considerable strain.

Previous Twin and Family Studies.

The papers to be mentioned do not perhaps include all references to the occurrence of sarcoidosis in siblings; nor unfortunately has it been possible to refer to the original paper in every instance. But they do high-light the existence of families with more than one affected member. Since the approximate incidence is one in 100,000 from American studies, it is improbable that such families represent chance events, but rather that they demonstrate the presence of a "familial" factor.

Sarcoidosis in identical twins has been reported four times. Sherer and Kelley (1949) and Gilg (1952) report examples of concordance in which the clinical course has been similar in both members of the pairs. Rogers and Netherton (1954) described the illness in identical twin sisters, in each of whom the onset was with rapid parotid swelling. Subsequently one twin developed severe uveitis, while the other showed persistent mild ill health and peripheral changes in the lungs. Plummer, Symmers and Winner (1957) have reported sarcoidosis in identical twins. The first twin, a contact of pulmonary tuberculosis, initially had mottling of the lung fields and small supraclavicular lymph glands, but died from inter-current torulosis. The other twin had larger lymph glands, some indigestion with evidence of disease in the terminal ileum, but no alteration in the lungs. Of the twins we have followed, in one the illness has presented major changes—iridocyclitis, lymph gland enlargement, skin lesions, and pulmonary and splenic changes. The other twin has had only minimal ill-effects.

Many of the family cases refer only to the two members involved. Bergmann (1939) referred to two sisters with sarcoidosis; Dressler (1939) referred to two brothers. MacCormac (1940) showed a patient with extensive skin lesions; her sister was seen briefly and had similar lesions. Van Buchem (1946), in discussing liver biopsy on sarcoidosis, discussed one patient whose brother was reported to have had the disease for several years. In Leitner's case (1946) the disease ran a similar course in brother and sister. Boggild (1944) saw two patients with osteitis tuberculosis cystica.

Other reports are more useful since they include data on siblings. Sellei and Berger (1926) reported five out of seven siblings affected. Dressler (1938) reported a brother and sister with sarcoidosis. One other sister had died of tuberculosis, another had had two periods of sanatorium treatment, while three remaining siblings were well. Robinson and Hahn (1947) described two families. In one family two brothers were affected and another brother was not. A second family of 10 siblings provided three established and three probable cases. Bickerstaff (1949) saw two brothers with sarcoidosis. They had three brothers and two sisters who were healthy, and the family had lived on a farm in childhood. Voltz (1953) reported a brother and sister who were both affected. Swirsky and Lowman (1955) described a brother and sister with dissimilar forms of the disease. Zwanenberg and Barry (1955) described a family of whom one sister had sarcoidosis and three brothers "atypical tuberculosis".

Summarizing these reports, we can say that family cases occur, sometimes in association with tuberculosis in other members, and that there is a tendency for the disease to run a similar course in members of the same family.

Discussion.

The recurring question about sarcoidosis is the nature of its relationship to tuberculosis. One view is that there is an essential connexion between the two conditions. In commenting on the results of liver biopsy in sarcoidosis,

Mather, Dawson and Hoyle (1955) state that "it would suggest that sarcoidosis represents an exaggerated and sometimes longlasting reticulo-endothelial reaction following primary tuberculous infection". Is this hypothesis adequate for the present facts and a basis for future observation? Longcope and Freiman (1952) and Refvem (1954) reject any essential connexion between the two conditions. Currently there seem to be three lines of inquiry into the nature of sarcoidosis against which we can survey the evidence of a genetic or familial factor in the illness.

In the broad field of epidemiology, Michael, Cole, Beeson and Olson (1950) first showed that cases of sarcoidosis in the American Army occurred predominantly amongst men born in southern and rural areas (of the United States). A more detailed study suggested certain soil areas in southern United States (Gentry, Nitowsky and Michael, 1955) as being "responsible" for an increased incidence. Such data served, in part, to explain the high incidence in negroes of the south, but not of Chicago, and the lack of cases in those persons of Scandinavian origins of the upper Middle West. One further observation of interest was that the number of patients who gave positive reactions to Mantoux tests differed between patients from rural and from urban areas, a finding difficult to reconcile with the hypothesis of Hoyle and his colleagues. Another epidemiological study, using patients seen in the Veterans Administration hospitals, confirmed the earlier findings in part, but it did not find that the area of increased incidence was so well demarcated by soil boundaries. Nor did these authors find that farm workers were especially liable (Cummings, Dunner, Schmidt and Barnwell, 1956). Israel *et alii* (1950), working in Philadelphia, commented that their negro patients were born in southern Atlantic states, whereas many of their control subjects were native Pennsylvanians. On the other hand, Carr and Gage (1954) found no difference in age, sex, race or birthplace between patients with sarcoidosis and all patients at the Mayo Clinic. No finality has been reached, yet these studies suggest that cases in one family may reflect an environmental or a genetic (or racial) factor in the illness.

In the clinical field, much work is current on the possibility of showing some difference in antibody or inflammatory responses between patients with sarcoidosis and other persons. Refvem (1954) explored the response to injected inert substances—quartz and egg and human phospholipid. Since he found no differences between the response in patients with sarcoidosis, tuberculosis and other diseases, he thought that the concept of a specific type of sarcoid reaction was untenable. Refvem favours a concept that sarcoidosis is a hypersensitivity disease related to phospholipid. However, Hoyle, Dawson and Mather (1954) showed that patients with sarcoidosis showed no reaction to tuberculin in 40 of 90 cases; and 20 of 43 cases of reticulosis, a similar proportion, also gave negative results. A matched control group showed negative results in nine out of 43 subjects. They therefore conclude that since tuberculin insensitivity is a feature of reticulo-endothelial disorders in general, it cannot be used to adjudicate on the connexion between sarcoidosis and tuberculosis. Similar conclusions were reached by Sones and Israel (1954) in respect to sensitivity to pertussis agglutinogen, mumps virus and oidiomycin, as well as to tuberculin.

This different tuberculin sensitivity is also reflected in the response to B.C.G. inoculation. Forgacs, McDonald and Skelton (1957) showed that of 10 patients with sarcoidosis, four of whom were tuberculin-sensitive, conversion of sensitivity occurred in two patients only, and those originally "positive" showed no increase in sensitivity. Israel *et alii* (1950) reported similar observations. Lemming (1940, 1942) was the first to demonstrate this lack of response. He thought that the local B.C.G. lesion was different; but Israel *et alii* showed that the naked-eye appearance was the same, while Forgacs and his colleagues showed it was similar microscopically and bacteriologically. This evidence therefore suggests a difference in reticulo-endothelial responsiveness in sarcoidosis, but it does not implicate the tubercle bacillus as the stimulus to this response. The presence of sarcoidosis in identical twins, or in more than one member of a family, would suggest that such altered responsiveness may be genetic in origin.

Finally, there have been studies on the chemical composition of sarcoid tissue. Nethercott and Strawbridge (1956) isolated a waxy substance from sarcoid tissue. In respect to acid-fastness and alcohol-fastness, infra-red spectrum and melting point (Strawbridge and Nethercott, 1957), this substance resembles mycolic acid—a waxy substance derived from *Mycobacterium tuberculosis*. They also demonstrated the presence of diaminopimelic acid, a substance found in various bacteria including *M. tuberculosis*. Such findings suggest in more direct fashion that sarcoidosis results from mycobacterial invasion. This then would be compatible with those family studies in which sarcoidosis and tuberculosis exist in different members, the different responses being genetically determined.

Unfortunately, the reports mentioned, including our own, are insufficient to provide useful evidence about the nature of sarcoidosis. Family cases and cases of concordance in identical twins almost certainly indicate a familial factor. The isolated report is unable to provide evidence on hypotheses of a genetically determined illness (similar, say, to cystinuria), of an infective illness, of a genetically determined reaction (as postulated by Hoyle), or of tuberculosis as the primary stimulus. But a systematic family study comparing the incidence of sarcoidosis and tuberculosis in sibships, and using propositi with sarcoidosis or primary tuberculosis, would answer several of these questions.

Summary.

1. During a study of illness in twins, a group of selected twins were seen, representing some of the twins in an undefined group of patients.

2. Of eight identical pairs, concordance occurred in six, including twins with duodenal ulcer, indirect inguinal hernia, congenital megaureter, congenital mental defect, bilateral congenital dislocation of the hip and sarcoidosis.

3. The co-twin in the other two discordant pairs had died some years before the onset of illness in the index-twin.

4. This experience contrasts sharply with that found with regular ascertainment of twins, and it illustrates the pitfalls inherent in isolated reports of concordance.

5. The histories are given of identical female twins, aged 27 years, with sarcoidosis, with reference to the past family history of tuberculosis and to the history of migraine, dysmenorrhœa and subfertility in both twins.

6. Other references to sarcoidosis in identical twins and in siblings are briefly recorded.

7. These evidences of a familial factor are reviewed against present epidemiological, immunological and chemical studies of sarcoidosis.

8. It is suggested that a complete family investigation would help to decide between various hypotheses regarding sarcoidosis, including the concepts of a specific non-tuberculous ætiological agent, a specific sarcoid reaction or tuberculous infection as the primary stimulus.

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THE ABSORPTION OF PENICILLIN V IN CHILDREN.

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PENICILLIN V or phenoxymethyl penicillin is a type of penicillin particularly suitable for oral administration because of its great stability towards acid. It was first described in 1948 (Behrens *et alii*), but its extraordinary property of acid stability was not recognized until five years later (Brandl *et alii*, 1953).

Penicillin V has been used in the readily soluble form of the potassium salt, in the sparingly soluble form of the calcium salt and in the almost insoluble forms of the benzathine salt and the free acid. Solutions of these forms are all at least 20 times more stable than solutions of penicillin G, as measured by the half-life at pH 1·0 and 37° C. Suspensions of penicillin V are even more stable: for example, 20,000 units per millilitre suspensions

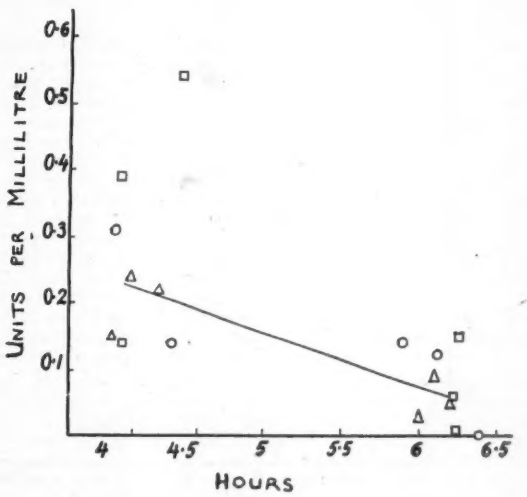

FIGURE I.

Concentrations of penicillin found in serum after oral administration of penicillin V as free acid.

of the above-mentioned forms of penicillin V were held for three hours at pH 1·0 and 37° C. and none lost more than 20% of its activity.

Most of the published work on the absorption of penicillin V has been done with adults, using the free acid form. With these limitations, it has been well established that the serum concentrations after oral administration of penicillin V are much higher than those after penicillin G (Putnam *et alii*, 1956). However, the duration of penicillæmia is not very different for penicillins V and G (Linden *et alii*, 1956). The proportion of the dose excreted in the urine is greater for oral penicillin V than for oral penicillin G, but not as great as for intramuscular penicillin G (Wright *et alii*, 1955).

The time of dosage in relation to meals probably has less effect on the efficiency of absorption of penicillin V than is the case with penicillin G, although the evidence is not consistent (Jones and Finland, 1955; Juncher and Raaschou, 1957).

Very few reports on the relative efficiency of the different forms of penicillin V were available when our experiments were performed. We are indebted to Dr. Henry Welch for drawing our attention to investigations then in progress in

the United States Food and Drug Administration Laboratories (since published, Wright and Welch, 1958) and in the Abbott Laboratories, North Chicago, U.S.A. (Sylvester and Merkel), and also to investigations in the Novo Laboratories, Copenhagen, Denmark (since published, Juncher and Raaschou, 1957).

These studies revealed that the potassium salt of penicillin V gave higher peak concentrations during the first hour following oral medication than did the calcium salt or the free acid form. At later stages after the dose the serum penicillin curves were similar for all the forms of penicillin V.

Only one study of the absorption of penicillin V in children has come to our notice (Holborow *et alii*, 1956), and this was concerned only with the free acid form. It was shown that penicillin V and penicillin G gave similar blood levels one hour after oral administration, but that, since the absorption of penicillin V was often delayed, blood levels after three to five hours were higher with penicillin V than with penicillin G. It was also shown that higher blood levels were observed when either of these penicillins was given half an hour after food than when given one hour before food.

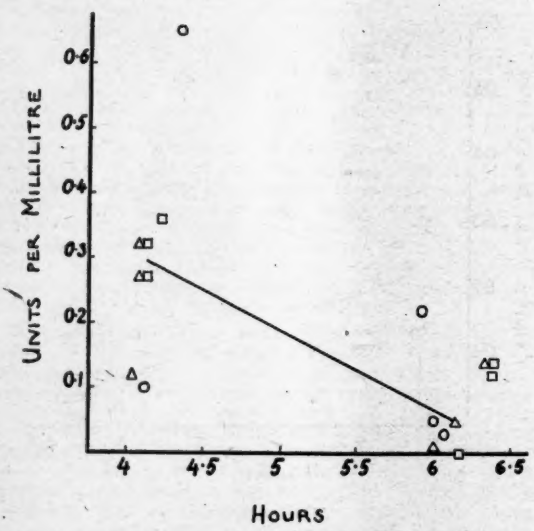

FIGURE II.
Concentrations of penicillin in serum after oral administration of penicillin V as calcium salt.

Our main object was to compare different forms of penicillin V with one another and with penicillin G in regard to the efficiency of absorption when given orally to children. A minor object of the investigation was to observe the effect of meals on the absorption of the penicillin.

Materials and Methods.

The subjects were nine patients at the Royal Children's Hospital, Melbourne. Their ages ranged from 5·3 to 13·0 years and their weights from 16·2 to 42·1 kilograms. None had any known kidney disorders.

The potassium and calcium salts and the free acid form of penicillin V were tested, together with the potassium salt of penicillin G. The dose was 200,000 units, given as a tablet followed by a little water. The tablets were capable of disintegrating in water within a few minutes.

The experiments were arranged as three separate series of "cross-over tests". Each of the three patients in the first series of tests received a different preparation on each of four successive days, three different preparations being used on each day. The doses were given one hour after breakfast. The second series of tests, on a fresh group of three patients, was conducted similarly, but the doses were given during breakfast. In the third series of tests, on a third group of three patients, the arrangement

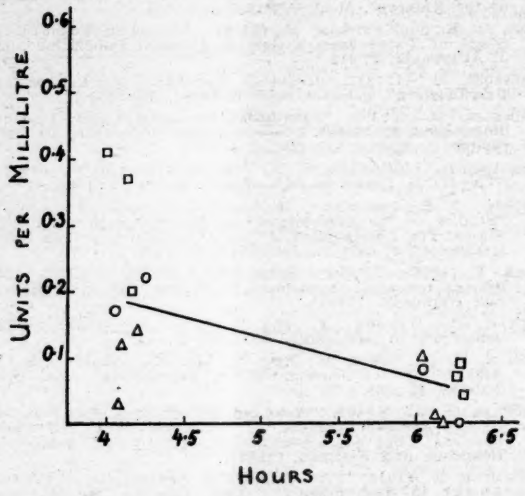

FIGURE III.
Concentrations of penicillin in serum after oral administration of penicillin V as potassium salt.

was similar, except that the doses were given one hour before breakfast.

Samples of blood were taken by venepuncture about four and six hours after the dose. As soon as the blood had

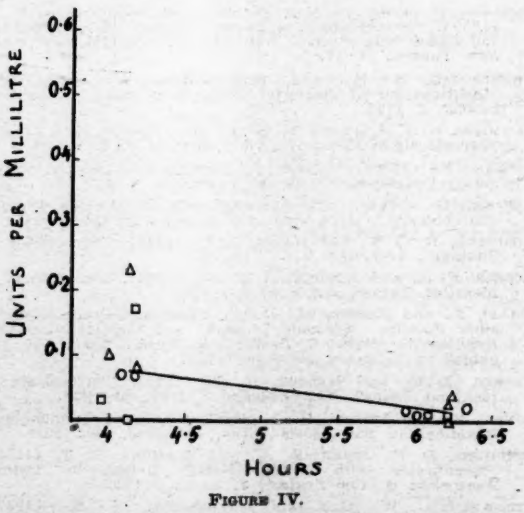

FIGURE IV.
Concentrations of penicillin in serum after oral administration of penicillin G as potassium salt.

clotted, the serum was separated and refrigerated until assayed (at −30° C. if the assay could not be made on the day of the experiment). The assays were made against standard preparations of penicillin V or G, using filter paper disks on plates inoculated with *Sarcina lutea* (strain 9341 of the American Type Culture Collection). The standards and, when necessary, the samples, were diluted with normal human plasma.

TABLE I.

Penicillin Excretion in the Urine of Children After the Oral Administration of 200,000 Units.[1]

Type of Penicillin.	Time of Dose in Relation to Breakfast.	Number of Subjects.	Interval after Dose.									
			0 to 15 Minutes.		15 to 45 Minutes.		45 Minutes to 6 Hours.		6 to 10 Hours.		Total. (0 to 10 Hours.)	
			Range.	Median.	Range.	Median.	Range.	Median.	Range.	Median.	Range.	Median.
Penicillin V-free acid	Data pooled for all times.	9	Trace– 0·7	0·06	0·2– 3·4	1·5	6·1–43·8	18·8	0·08– 4·5	0·86	8·0–45·9	20·6
Penicillin V-calcium salt		9	Nil–12·0	0·07	0·1– 6·0	1·7	4·2–32·3	15·2	0·28–11·0	1·86	4·7–40·6	20·0
Penicillin V-potassium salt		9	0·01– 2·7	0·13	1·3–21·3	4·3	0·6–20·2	7·6	Trace– 4·3	0·16	8·7–28·4	14·8
Penicillin G-potassium salt		9	0·02– 1·4	0·09	0·7– 8·3	1·5	3·1–24·1	8·7	0·01– 1·4	0·12	4·1–33·2	10·3
Data pooled for all penicillin V preparations.	One hour before.	9	Trace–12·0	0·09	0·2–21·3	3·8	0·6–32·3	19·0	0·08– 3·1	0·49	14·8–40·6	23·0
	During.	9	Trace– 0·8	0·08	0·2– 1·9	1·3	4·2–43·8	11·2	Trace– 2·3	0·29	4·7–45·9	12·9
	One hour after.	9	Nil– 2·7	0·15	0·1– 6·1	2·9	6·2–26·9	13·2	0·10–11·0	1·30	12·2–31·2	20·6
Penicillin G-potassium salt	One hour before.	3	0·04– 0·1	0·09	2·2– 8·3	3·1	3·6–24·1	15·9	0·12– 1·4	0·65	6·9–33·2	19·6
Penicillin G-potassium salt	During.	3	0·02– 1·4	0·08	0·9– 1·5	1·5	3·1– 9·7	8·7	0·01– 0·1	0·05	4·1–12·7	10·3
Penicillin G-potassium salt	One hour after.	3	0·02– 0·4	0·36	0·7– 1·6	1·2	3·4–10·5	5·1	0·04– 0·4	0·35	5·8–11·5	6·7

[1] The quantities excreted in various intervals are expressed as percentages of the dose.

All urine passed was collected 15 minutes, 45 minutes, six hours and 10 hours after the dose. The urine was buffered by the addition of phosphates and refrigerated until assayed (at –30° C. if the assay could not be made on the day of the experiment). The assays were made on dilutions of the samples in phosphate buffer pH 7·0, using cylinders on plates inoculated with *S. lutea*, against standard preparations of penicillin V or G diluted in phosphate buffer pH 7·0.

Results.

The concentrations of penicillin found in the serum about four and six hours after the dose was given are shown in Figures I to IV. Experiments in which the doses were given before, during and after breakfast are indicated by triangles, squares and circles respectively. The line in each figure connects points representing median concentrations.

It will be seen that the three penicillin V preparations gave approximately equal serum levels, significantly superior to those given by penicillin G. The effect of the time of the dose was not marked, but with the penicillin V preparations the highest serum levels were observed when the dose was given during breakfast.

The results of the assays on urine samples are summarized in Table I. Penicillin appeared promptly in the urine after oral administration of any of the preparations, the response being particularly rapid with the potassium salt of penicillin V. Excretion of penicillin continued for more than six hours in all patients, the quantity excreted between six and 10 hours after the dose being greatest with the calcium salt of penicillin V. The total quantity of penicillin excreted within 10 hours of the dose was significantly greater with the calcium salt and free acid form of penicillin V than with the potassium salt of penicillin G.

With all of the preparations the total quantity of penicillin excreted was highest when the dose was given one hour before breakfast, but the effect of the time of the dose was not so marked with penicillin V as with penicillin G.

Discussion.

This small-scale trial of different types of penicillin in children shows clearly that an oral dose of 200,000 units of penicillin V, in the form of free acid, calcium salt or potassium salt, is rapidly absorbed and maintains a therapeutically useful concentration of penicillin in the serum for at least four hours.

Because of the small number of patients and the large variation between experiments, caution is required in making comparisons between preparations and, especially, between times of dosage in relation to breakfast. Not all of the differences to which attention has already been drawn are statistically significant. A discrepancy between the results of the serum and urine experiments is apparent: judged by the penicillin concentrations in the serum after four or six hours, it is better to give penicillin V during meals rather than one hour before or after; judged by the quantity of penicillin excreted in the urine, the reverse relationship holds. The discrepancy may perhaps be explained by the fact that the average weight (22 kilograms) of the three children given doses during breakfast was less than the average weight (30 kilograms) of the six children given doses before or after breakfast. This difference in weights should not interfere with the comparisons between preparations, because each preparation was given to each patient.

No attempt was made to determine peak concentrations of penicillin in the serum of children, because preliminary work in adults had shown that the time of occurrence of the peak after oral administration of penicillin V was widely variable, and hence blood samples taken at frequent intervals would be required in order to locate the peak. Frequent bleeding of children being undesirable, it was decided to take two blood samples after the peak had almost certainly been passed, and to obtain multiple urine samples in order to check on the speed of absorption of the penicillin.

Summary.

1. Nine children were given 200,000 unit tablets of penicillin G (potassium salt) and penicillin V (free acid, calcium salt and potassium salt) at known times in relation to breakfast. Penicillin was determined in samples of serum taken four and six hours after the dose and in samples of urine taken at intervals up to 10 hours after the dose.

2. The three penicillin V preparations gave approximately equal serum levels, superior to those given by penicillin G. Penicillin V maintained a therapeutically useful serum level for at least four hours in all patients.

3. Penicillin appeared promptly in the urine with each of the preparations, the response being particularly rapid with penicillin V (potassium salt). Excretion of penicillin continued for more than six hours in all patients, the quantity excreted between six and 10 hours after the dose being greatest with penicillin V (calcium salt). The total quantity excreted was greatest with penicillin V (free acid or calcium salt) and least with penicillin G.

4. The effect of the time of dosage in relation to breakfast was not marked.

Acknowledgements.

Our thanks are extended to Dr. J. Perry and the staff of the Royal Children's Hospital, Melbourne, for collection of the samples of serum and urine. We are grateful to Dr. R. Greville, Dr. G. Trinca and Dr. E. Clarke, of the Commonwealth Serum Laboratories, for helpful advice and criticism. We also wish to thank the staff of the Antibiotics Assay Department for performing the large number of assays required.

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LIPOPROTEINS IN CORONARY SCLEROSIS INVESTIGATED BY PAPER ELECTROPHORESIS.[1]

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THE belief that atherogenesis and abnormal lipid metabolism may in some way be related has prompted a great deal of investigatory work. In spite of much evidence, many results remain equivocal. Techniques have varied so that results are not strictly comparable, and even when similar procedures have been used the conclusions obtained have sometimes been contradictory.

It is generally admitted that, at the present time, there is no method which will provide criteria upon which a definite diagnosis of atherosclerosis can be made. However, definite trends over a large series can be established, and the differing patterns of atherosclerotic and normal populations can be compared. Within each group the variations from case to case are sometimes great and the over-all difference between normal and subnormal subjects is often small.

To demonstrate these points a brief review of the results obtained by several leading workers in this field will be presented (Table I).

The methods for the study of lipoproteins are well known, and include separation by ultracentrifugation, by chemical fractionation and by electrophoresis. These techniques employ the different properties of density, solubility and mobility respectively.

Gofman and his co-workers are the leading proponents of the ultracentrifuge method, and although their work is often quoted as being fully established, other prominent groups in the United States of America, including the Harvard group (Lawry *et alii*, 1957), have been unable to confirm all Gofman's work. It had long been Gofman's contention that the refined, expensive and lengthy method of ultracentrifugation provided an analysis of lipids which could be related to both the diagnosis and the prognosis of atherogenesis. Jones, Gofman *et alii* (1951) had previously found that the correlation of S_f 12–20 lipoproteins with atheroma was from two to four times as significant as the cholesterol level, and that in atheroma high S_f 12–20 levels frequently occurred with a normal serum cholesterol level. It came as a surprise, therefore, when other laboratories found that the prognostic significance of serum lipoproteins was no greater than that of serum cholesterol, and that the small size and the great variability of the differences between the serum lipoproteins of normal and abnormal subjects made these indices unreliable for clinical prediction.

The significance of cholesterol is likewise not undisputed. Oliver and Boyd (1953) investigated 200 people with coronary sclerosis and matched them for age and sex with apparently normal controls. They found that in atherosclerosis the cholesterol levels were significantly elevated at all ages (except in the sixth decade in females). However, an examination of their tables reveals a wide scatter about the means in both the atherosclerotics and the controls, so that a cholesterol estimation, unless the level is considerably elevated, is of little value for individual assessment. Moreover, other workers such as Russ *et alii* (1951) were unable to find any significant difference.

Another index which is often quoted is the cholesterol-phospholipid ratio of the total plasma and of each lipoprotein. Three reliable investigators again differ in their conclusions. The figures obtained for normal plasma by Swahn (1953) and by Russ *et alii* (1951) agree fairly well; they were 0·96 and 0·93 respectively. Although, once more, there were considerable individual variations, Oliver and Boyd (1955) found this value to be 0·82. Whereas Russ *et alii* were then unable to find a significant rise among their atherosclerotic patients, Oliver and Boyd's figures averaged 1·04—a very significant increase. It should be mentioned that Swahn and also Oliver and Boyd used the method of paper electrophoresis, while Russ *et alii* used the method of chemical fractionation.

Filter paper electrophoresis has so far provided the simplest method for the differential estimation of lipoproteins. This technique can be put to various uses. Individual lipoproteins may be estimated by direct photoelectric scanning, or by eluting them and measuring the optical density of the adsorbed dye in a spectrophotometer (Swahn, 1953). The cholesterol and phospholipid content of each lipoprotein can be estimated chemically and the ratio of cholesterol of beta lipoprotein to that of alpha lipoprotein can be calculated. This latter ratio was found by Oliver and Boyd (1955) to vary from 2·4 in healthy men, to 10 in patients with coronary sclerosis. Nikkila (1953) found the corresponding figures to be approximately 2·2 and 3·4.

Another ratio which is considered of some importance is that of total alpha lipoprotein to total beta lipoprotein. Russ *et alii* (1951) and Rosenberg (1954) agreed that the alpha lipoproteins were quantitatively reduced in atheroma, while the beta lipoproteins were elevated. The beta/alpha ratio was therefore raised in atheroma.

The simplicity of the method of paper electrophoresis is appealing. Of all the preceding indices of atherosclerosis the beta-alpha lipoprotein ratio is the easiest to calculate, and, as the beta fraction is elevated in atheroma and the alpha fraction is depressed, it seems that this ratio may give a more sensitive indication of disease. Rosenberg *et alii* (1954), employing this technique, had already confirmed its usefulness on a small series. The purpose of this work is to reassess this assertion.

[1] This work was carried out at the Royal Hobart Hospital.

TABLE I.

Method.	Estimation.	Authors.	Results.	
			Normal.	Atherosclerosis.
Ultracentrifuge	Beta lipoprotein level.	Jones, Gofman *et alii* (1951).	S_f 12–20 lipoproteins not elevated.	S_f 12–20 lipoproteins significantly and diagnostically elevated.
		Lawry *et alii* (1957).	—	Could not confirm Jones's findings.
Chemical	Serum cholesterol content.	Oliver and Boyd (1953).	—	Significant increase of cholesterol.
		Russ *et alii* (1951).	—	No significant increase of cholesterol.
Chemical fractionation ..	Cholesterol-phospholipid ratio.	Swahn (1953).	0·96	—
		Russ *et alii* (1951).	0·93	0·96
Paper electrophoresis ..	Cholesterol-phospholipid ratio.	Oliver and Boyd (1955).	0·82	1·04
		Nikkila (1953).	0·94	—
Paper electrophoresis ..	Ratio of cholesterol beta lipoprotein to cholesterol alpha lipoprotein.	Oliver and Boyd (1955).	2·4	10·0
		Nikkila (1953).	2·2	3·4
	Ratio of total beta lipoprotein to total alpha lipoprotein.	Rosenberg *et alii* (1954).	2·4	4·4
		Nestel and Osborn (1953).	2·38	2·63

Methods and Materials.

Fifty patients known to be suffering from coronary sclerosis were compared with 50 apparently normal people. There were 25 male and 25 female patients, and they were between 45 and 75 years of age. They had all had at least one attack of myocardial infarction proved by an electrocardiogram. There were no predisposing diseases other than atherosclerosis. The controls were matched for sex, but were less than 35 years of age and with no elicitable history of any disease. The questions of age and sex are discussed later.

EEL electrophoretic equipment was used. The buffer solution consisted of a solution of 10 grammes of soluble barbitone and 6·5 grammes of hydrated sodium acetate adjusted to a pH of 8·4 with hydrochloric acid (Michaelis solution). Whatman number 1 filter paper was used and 0·18 cubic centimetre of serum applied to each 7·3 centimetre strip. A current of 175 volts was applied for 16 hours to give a resulting current of 1·1 milliamps per centimetre.

After the papers had been dried in a hot-air oven, they were divided into longitudinal strips, two of which were used for staining with Sudan Black B, with and without ethanol extraction, and one for protein-staining with bromphenol blue. All the lipid strips were stained with Sudan Black B, and a further 20 were duplicated and stained with Oil Red O, since some authors have claimed that the latter stain is superior. Sudan Black colours lipids specifically, and although it will not stain lipid components which are crystalline in the pure state, these substances are usually dissolved in other lipids which are liquid at room temperature. It is highly probable, therefore, that all the lipid in the serum is stained.

The Sudan Black B was dissolved in a 55% solution of ethanol at room temperature. If it is brought to the boiling point additional stability can be obtained, but in these experiments fresh solutions were used. A 55% solution of ethanol was chosen, since the stain is fairly soluble in solutions above 50% ethanol, and the coefficient of partition for Sudan Black between lipids and 50% to 70% ethanol solution is highly favourable to the lipids.

The strips were stained for one hour. Most of the staining takes place during the first hour, although Swahn (1953) showed that some additional uptake of the stain occurs for a further two hours.

As Sudan Black is only slightly soluble in less than 50% ethanol, this concentration was selected as a rinsing fluid, the strips being washed three times until most of the dye adsorbed to the paper between the lipid bands was removed.

The strips were then scanned and the beta-alpha ratios calculated. Although accurate quantitative scanning was achieved it was thought that a clearer qualitative differentiation of the lipid bands could be obtained by removing some of the lipid, especially the trailing neutral fat zone. Accordingly, the duplicates of the above-mentioned strips were placed in absolute alcohol for four minutes. The strips were then stained and scanned as before. These will be referred to as the eluted strips.

It was necessary to determine approximately how much lipid was extracted by the foregoing method, so cholesterol estimations were made on some of these eluted strips using the Lieberman-Burchard reaction. In addition, it was essential to know whether the extraction of the lipid had been uniform throughout the bands.

A further smaller series of the sera of 20 patients and of 20 controls was used for staining with Oil Red O. Eluted strips only were studied. A saturated solution of Oil Red O in ethanol (55%) was used, and the period of staining was 15 hours. They were rinsed for a few minutes in a 55% solution of alcohol.

Finally, the mobilities of the beta lipid bands in normal subjects and in atherosclerotics were calculated.

Results and Discussion.

General Description of Lipid Zones.

The general mobility of the bands depends on their electric charges and on their degree of adsorption to the filter paper. Neutral fats do not migrate at all when the method of filter paper electrophoresis is used. However, with free electrophoresis, neutral fats will migrate as far as the alpha-2 globulins, and Swahn (1953) concluded, therefore, that the degree of adsorption to the paper of molecules of different sizes greatly influenced their mobility.

It can be seen from the illustrations (Figures I and II) that the band extending from the point of application of the serum to the rear of the beta lipoprotein region consists of neutral fat and trailing beta lipoprotein. It is greatly diminished in the eluted strips as they have mostly been extracted by the ethanol.

In front of the neutral fat are the beta lipoproteins. In the uneluted strips these are seen as a fairly homogeneous dense band travelling at the speed of beta globulin. There is no obvious degree of separation within the band. In the ethanol-eluted strips, obvious splitting of the beta lipoproteins into two distinct bands is evident; in the majority of sera studied, this occurred equally in both the atherosclerotics and the controls. These two groups of molecules have been classified as beta-1 and beta-2 lipoprotein. This differentiation has received very little attention from other workers. Separation adequate to demonstrate several subordinate groups within the two major lipoprotein groups

can be achieved by decreasing the ionic strength. Carlson (1955) illustrates this point with a lipoprotein strip in which the beta zone is represented by two major and distinct peaks, somewhat similar to our own. A study of these two bands, and particularly an estimation of their ratios in the two series, was the principal aim in the study of the eluted strips.

The alpha lipoproteins travelled with a mobility between that of albumin and alpha-1 globulin. Occasional splitting into two bands was found at times, but not as often as in the beta lipoproteins. (Nikkila, 1953, had observed this splitting, and used the terms alpha-1 and alpha-2 lipoproteins.)

The Effect of Elution.

The colorimetric estimation of the cholesterol remaining in the strips after elution showed that total extraction was not effected. This was not estimated quantitatively, as this experiment was designed merely to compare ratios of lipid components in normal and in atherosclerotic subjects. Provided elution is similar in the two groups, comparisons are legitimate. This was determined by scanning the uneluted and the eluted strips and then calculating the ratios of uneluted to eluted values for each lipoprotein. It will be seen from Table II that elution within the beta bands was even, and therefore comparisons of beta-1 with beta-2 ratios in the two groups can be made. An altered distribution of various beta lipoprotein molecules was a feature of atherosclerotic patients investigated by the ultracentrifuge technique. It was thought, therefore, that a suitable index of atherosclerosis could be derived from a beta-1 : beta-2 ratio.

The findings were as follows: The ratio of beta-1 to beta-2 lipoprotein in atheroma was 0·91; the ratio of beta-1 to beta-2 lipoprotein in the controls was 0·90. It appears, therefore, that in atheroma there is no alteration of the relationship which these two main groups of molecules in the beta band bear to eath other.

TABLE II.
Effect of Elution.

Subjects.	Lipoprotein Ratio, Uneluted : Eluted Strips.			
	Alpha.	Beta-2.	Beta-1.	Average Beta.
Normal	1·25	2·88	2·64	2·76
Atherosclerotic ..	1·36	2·72	2·62	2·66

In the alpha lipoprotein region, slightly greater elution has taken place in the atherosclerotics than in the controls. On the other hand, slightly less elution has occurred in the beta band. Although the differences are small, the tendency has been for more beta lipoprotein and for less alpha lipoprotein to remain after elution in strips of atheromatous patients than in strips of the controls. This would artificially elevate the beta-alpha ratio in the former group. Although this ratio is presented in Table III, it is obviously not as reliable as that of the uneluted series.

However, this altered behaviour on elution may be significant in itself, in so far as it may be due to an abnormality of lipoproteins.

Calculation of Ratios of Beta Lipoprotein to Alpha Lipoprotein.

As was mentioned earlier, the ratios of beta lipoprotein to alpha lipoprotein were calculated in three separate experiments (Table III)—(*a*) in uneluted strips; (*b*) in eluted strips stained with Sudan Black B; (*c*) in eluted strips stained with Oil Red O.

In the eluted strips, the distribution of the ratios was so irregular that it could hardly be considered to have followed a "normal" or Gaussian distribution from a statistical point of view. Accordingly the logarithm to base 10 of $(1+x)$, where x is the beta-alpha ratio, was taken as an index of this ratio; the resulting set of figures conformed more closely to a "normal" distribution. In the larger series of uneluted strips no such transformation was required.

The degree of probability ($P=0·15$) in the uneluted strips is regarded statistically as being not significant. All that can be claimed is that this particular group of 50 elderly atherosclerotic patients has an average beta-alpha lipoprotein ratio which is slightly higher than that of an equal number of normal young men and women. The questions of age and sex are discussed later. In addition, when the wide scatter about the means is considered, it will be seen that this technique does not allow conclusions to be drawn from individual estimations.

TABLE III.

Strips Used in Experiment.	Ratio of Beta Lipoprotein to Alpha Lipoprotein.		Probability.
	Atherosclerotic Subjects.	Normal Subjects.	
Uneluted	2·63	2·38	0·15
Eluted, stained with Sudan Black B	1·36	1·16	—
Eluted, stained with Oil Red O..	1·25	1·03	—
Eluted; result expressed as $\log\left(1+\frac{\text{beta}}{\text{alpha}}\right)$	0·373	0·313	0·047

The ratios calculated from the eluted strips are much less equivocal, the difference in the two groups being of statistical significance ($P=0·047$). However, certain objections raised against this particular experiment have been discussed earlier.

Age and Sex.

The selection of normal controls is a most difficult problem in work of this kind. The increasing incidence of atheroma in men after the third decade and the immunity which young women enjoy are well known.

Nikkila was careful to compare normal controls of all ages and both sexes, and his beta-alpha ratios for three representative groups were approximately as follows: for young women, 1·5; for young men, 1·8; for the 41 to 60 years age group, 2·2. As his ratio for coronary sclerotics was around 3·4, it is evident that the age group selected for normal controls would greatly alter any significant difference found.

Our control group consisted of almost equal numbers of males and females, aged between 18 and 35 years. At this age the females may be regarded as suffering from minimal atherosclerosis only, whereas it is at this age that atherosclerosis becomes established in males.

The influence of the person's sex was investigated in only 10 normal males and 10 normal females by the use of eluted strips. Even in such a small series the difference is considerable, the beta-alpha ratios for males and females being 1·13 and 0·93 respectively.

The ratio for the atherosclerotics in this series was 1·25. It can be seen how much more significant would be a comparison with young female controls. Rosenberg *et alii* had, in fact, used only young females as controls, and that is the probable explanation of their significant result.

However, in our larger series of uneluted strips there was no significant difference between the two groups, even though half the controls were young women.

Electrophoretic Mobilities.

As mobility depends partly on molecular size and composition, this question was also investigated. The distance travelled by the front of the beta band was taken as an index of electrophoretic mobility. The strips in the Oil Red O series were used; these were cut in half lengthwise,

ILLUSTRATIONS TO THE ARTICLE BY JOHN A. SNELL, M.B., B.S., F.R.C.S., F.R.A.C.S.

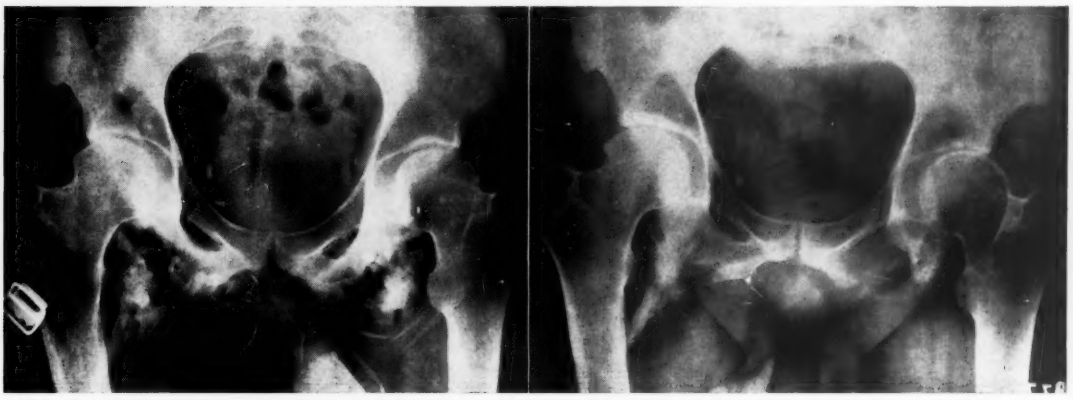

FIGURE VI.

Skiagram of patient in Figure V, showing gross ischial bony infection and ossification in the soft tissues prior to surgery.

FIGURE VII.

Skiagram after excision of the right ischium. More radical bony excision than this is preferable.

ILLUSTRATIONS TO THE ARTICLE BY H. IAN JONES AND R. K. DOIG.

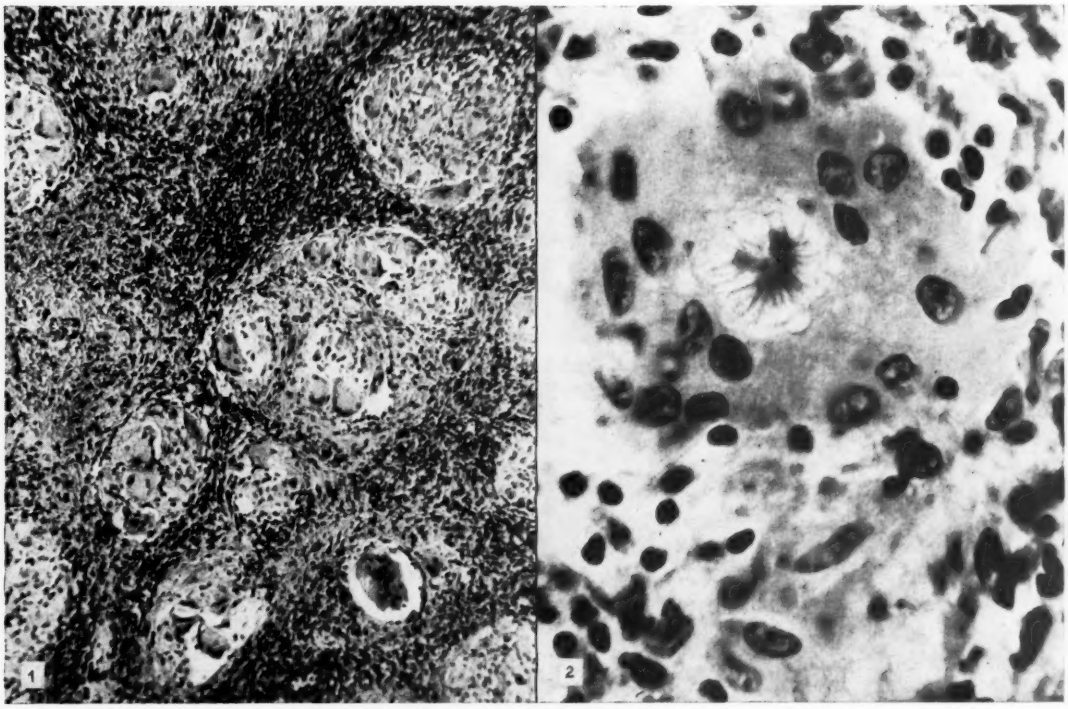

FIGURE I.

Photomicrograph of section of spleen showing epithelioid tubercles with numerous giant cells.

FIGURE II.

Photomicrograph of section of spleen showing asteroid body in a giant cell.

ILLUSTRATIONS TO THE ARTICLE BY P. J. NESTEL, M.R.A.C.P., AND E. OSBORN, B.Sc.

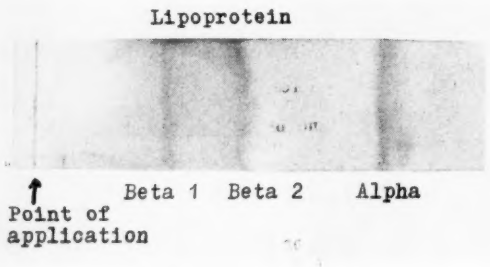

FIGURE I: Eluted strip.

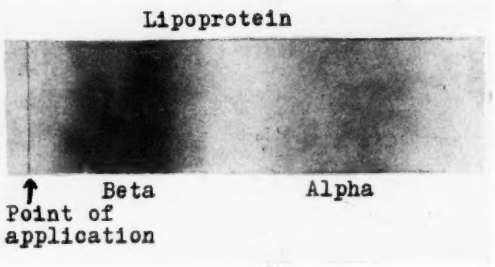

FIGURE II: Uneluted strip.

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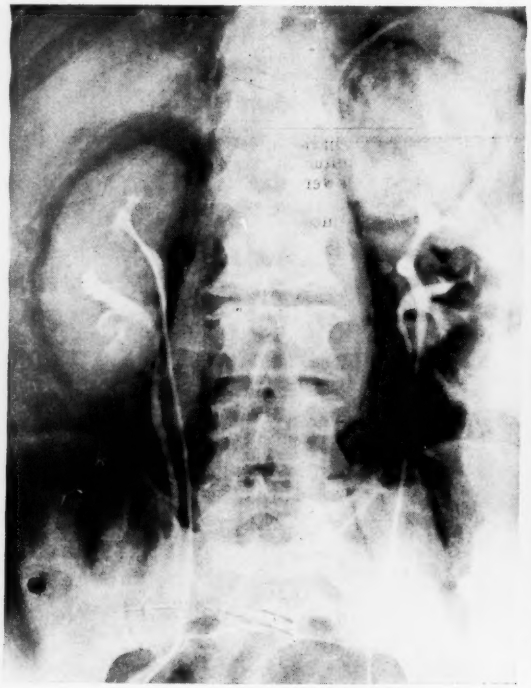

FIGURE I.
Intravenous pyelogram taken after presacral pneumography, outlining the left suprarenal tumour and the double pelves and ureters.

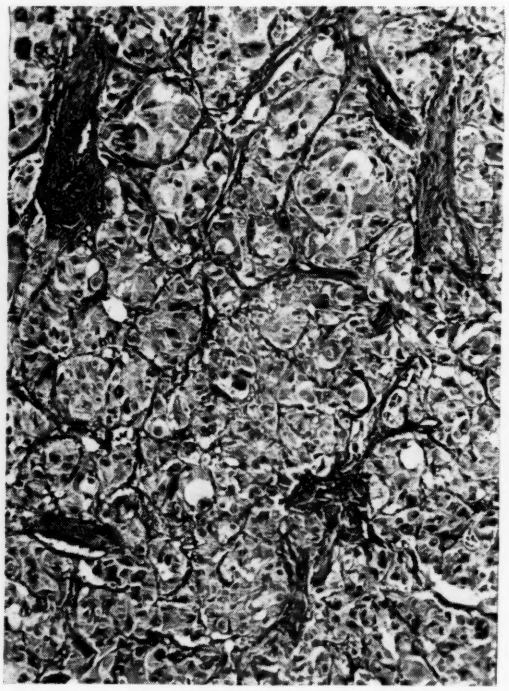

FIGURE III.
The microscopic appearance of the suprarenal tumour.

and one half was stained for proteins and the other half for lipids. A comparison was then made of the distance travelled by the front of the beta lipoproteins with the total protein length.

The mobilities within the two series agreed very closely, so the difference obtained was highly significant, as follows: mean for atherosclerotic subjects, 46·8; mean for normals, 44·8; probability, 0·017.

Rosenberg *et alii* (1954) and Jencks *et alii* (1956) were unable to find a significant increase in mobility.

Limitation of Technique.

Electrophoretic studies of lipoproteins represent an approach to the study of lipoprotein distribution which is of a semi-quantitative nature only for a variety of reasons. On paper there is considerable adsorption of low density molecules which interfere with the resolution of the lipoprotein spectrum. Beer's law may not operate over the complete range of optical densities encountered in a particular study, while the affinity of the various lipids and sterols is, in general, not always proportional to their weight. Furthermore, lipids in complex mixtures may influence each other's chromogenicity. Results of electrophoretic studies may legitimately be used for comparative purposes, but their usefulness is not as great for establishing absolute values.

Summary.

A comparison of the beta-alpha lipoprotein ratios of a group of 50 middle-aged and elderly patients suffering from coronary atherosclerosis with those of a group of 50 healthy young men and women produced a difference which was statistically not significant. Nevertheless, there was a tendency for the ratio to be lower among the normal controls.

When the paper strips were eluted in alcohol, a procedure which removed most of the fat and a varying amount of lipoprotein, resolution of the beta lipoprotein molecules into two distinct groups was achieved. Ultra-centrifugal studies by other workers had shown that the distribution of molecules within the beta lipoproteins was altered in atherosclerosis. However, in this study the relationship of the two beta bands was identical in the two series.

In the eluted strips there was a statistically significant difference in the values obtained for beta-alpha ratios in the two groups. However, this method was not considered to be as reliable as when no elution was carried out.

The beta lipoproteins of atherosclerotic serum appear to possess an increased electrophoretic mobility, and the possibility that this may be significant seems to be high.

Acknowledgements.

We wish to thank Dr. A. J. Dobson, of Hobart, for his encouragement and advice.

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Reports of Cases.

PHÆOCHROMOCYTOMA OF LONG DURATION.[1]

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FUNCTIONING TUMOURS of the adrenal medulla or other chromaphil cells have produced a literature which far outweighs their importance, as judged by their frequency. The widespread interest stems from the precision of diagnosis afforded by the exhibition of specific antagonists to their secretion and by the recovery of the products of this secretion in the urine. Further, the possibility of surgical cure with relief of systemic hypertension has alerted clinicians otherwise dismayed by their impotence in arresting hypertensive disease. Benign functioning tumours in other endocrine glands such as the thyroid, islets of Langerhans or parathyroids may exhibit episodes of remission, but it is not widely realized that the same intermittent type of activity may characterize a phæochromocytoma.

The following history of a case illustrates this phenomenon.

The patient, a male agricultural fitter, aged 58 years when he was first seen in consultation in a country town, presented a remarkable picture of generalized flushing and profuse sweating, and he had cold, white hands and feet, together with a marked rise in systemic arterial pressure. His previous medical history had been uneventful, and there was no family history of hypertensive disease. He stated that these paroxysms had begun 10 years previously, in the winter of 1946, occurring at approximately two-weekly intervals, and had continued until 1951. Each attack occurred without warning, but tended to follow any severe physical effort, emotional upset or minor respiratory infection. The attacks followed a constant pattern, characterized by marked pallor of the hands and ears, suffusion of the face, a feeling of constriction in the lower sternal region and epigastrium, with dyspnœa and excessive sweating. His head ached violently, and his limbs became tremulous; he experienced palpitation, tingling in the extremities, and great exhaustion. Sometimes he micturated involuntarily, but never vomited. Shortly after the onset of these attacks, and in the interval between two of them, he consulted his doctor, who found his systolic blood pressure to be 180 millimetres of mercury, and the diastolic pressure to be 75 millimetres of mercury. He was subjected to an X-ray examination of his chest, an electrocardiographic examination and glucose tolerance test; all gave normal results. He remained free from further attacks for five years, and a medical examiner then noted that his blood pressure was 170 millimetres of mercury systolic, 110 millimetres of mercury diastolic. A further four years elapsed without medical incident, but in October, 1956, after a mild respiratory infection, he began again to experience the same syndrome, but in an even more severe form. The frequency of the seizures increased also, and they now lasted for as long as 20 minutes with incomplete subsidence in the intervals between them. At this point, the patient was transferred to the Royal Prince Alfred Hospital, Sydney. Here it was observed that he had lost weight, but, between paroxysms, was comfortable. He appeared slightly florid in complexion, with a dry skin, cold, pink extremities and a pulse rate of 80 per minute His blood pressure on his admission to hospital was 120/80 millimetres of mercury A paroxysm was readily induced, even by conversing with the patient about his illness, or on one occasion by palpation of the left loin. The change in his appearance was sudden and dramatic. His complexion became salmon pink, the skin of the trunk became flushed, while his hands and feet became cold and assumed a mottled pink and white

[1] Reported at a meeting of The Royal Australasian College of Physicians, October, 1957.

hue with cyanosis of the fingers and toes. Capillary stasis was obvious. A drenching sweat, anxiety and tremor followed. His respirations increased, and he appeared to be in considerable distress. The pulse rate rose to 120 per minute and the blood pressure to 200/140 millimetres of mercury. His apex beat was displaced to the left and the aortic second sound was increased in intensity, but no other cardiac abnormalities were noted. Examination of the *fundus oculi* revealed arterial constriction and "nipping" at the arterio-venous crossings. Examination of his chest revealed no signs of pulmonary œdema. He appeared to be tender to palpation in the left renal area, but no mass could be felt. His urine contained a moderate cloud of albumin, and glycosuria was frequently detected. The specific gravity varied from 1008 to 1014. His temperature often rose after an attack to 100° F. Between these episodes his blood pressure varied from 140/80 to 70/50 millimetres of mercury. Microscopic examination of the urine revealed some granular and hyaline casts. Urea clearance was 48 cubic centimetres (normal). His leucocyte count was elevated to 31,000 per cubic millimetre, of which neutrophils constituted 84%, lymphocytes 10% and monocytes 4%. His erythrocyte sedimentation rate (estimated by the Wintrobe method) was 11 millimetres after one hour. His blood urea content at this time was 91 milligrammes per 100 millilitres. He excreted 5·5 milligrammes of 17-ketosteroids in 24 hours. The basal metabolic rate between attacks was +13%, and a glucose tolerance test gave the following blood sugar levels (milligrammes per 100 millilitres): before ingestion of glucose, 159; at one hour, 221; at one and a half hours, 251; at two hours, 204.

An electrocardiographic examination showed sinus tachycardia and left ventricular hypertrophy. An X-ray examination of his chest indicated some "increased lung markings at the left base". Through the kindness of the Baker Medical Research Institute of the Alfred Hospital, Melbourne, an estimation of the amount of catechol amines in a 24 hour specimen of urine revealed an excretion of 154 microgrammes per litre in this period (upper limit of normal, 80 microgrammes per litre). After suspension of all sedation for 24 hours, five milligrammes of "Regitine" (phentolamine) injected intravenously resulted in a fall of blood pressure from 165/110 millimetres of mercury to 60/50 millimetres in six minutes, followed by a slow rise to 130/80 millimetres. Twenty milligrammes of "Piperoxane" (di-ethyl amino-ethyl-benzodioxane) given intravenously caused the blood pressure to fall in four minutes from 200/140 to 130/95 millimetres of mercury. Bilateral retrograde pyelography accompanied by presacral pneumography of the perirenal area by Mr. B. Pearson was reported upon by him as follows (Figure I).

> The pyelograms show a double renal pelvis and double ureters in each side. The double ureters appear to unite distally, forming a single ureteric opening into the bladder on each side. The kidneys and ureters otherwise appear normal. On the left side is a rounded tumour outlined by air below the left diaphragm medially and overlying the upper pole of the left kidney. It measures 7-8 centimeters in diameter and is distinct from the upper pole of the kidney. It is presumably a tumour of the suprarenal gland. The right suprarenal appears normal in size, shape and position.

On November 28, 1956, the tumour was exposed by Mr. F. W. Niesche from the anterior aspect, using a combined abdomino-thoracic approach. By this means it could be lifted gently from its bed under the left cupola of the diaphragm, and its vascular connexions divided with minimal disturbance. The anaesthetic agents chosen by Dr. B. S. Clifton and Dr. J. MacRae were "Pentothal" and "Scoline", followed by tubocurarine, nitrous oxide and oxygen. Two to five milligrammes of "Regitine" were added to saline, given by continuous intravenous drip, whenever the systolic blood pressure exceeded 190 millimetres of mercury as measured intraarterially. A systolic peak of 225 millimetres of mercury occurred during the final delivery of the tumour, and altogether 50 milligrammes of "Regitine" were administered throughout the whole procedure. As the final vein related to the tumour was ligated, the blood pressure fell abruptly to a systolic level of 60 millimetres of mercury, but was immediately restored by the addition of three milligrammes per litre of noradrenaline to the intravenous drip for a period of one hour after the removal of the tumour. The right adrenal gland was not exposed.

The patient's convalescence proceeded uneventfully, with blood pressure constantly in the region of 130/90 millimetres of mercury. No further vasospastic crises were observed. The hands and feet exfoliated.

A further series of investigations were conducted 10 days later. The urine was free from albumin with a specific gravity of 1020, but still contained a few granular casts. The blood hæmoglobin value was 10·5 grammes *per centum* and white cells numbered 7000 per cubic millimetre. The blood urea content was 37 milligrammes per 100 millilitres, and the basal metabolic rate had fallen to +1%. A glucose tolerance test gave the following blood sugar levels (milligrammes per 100 millilitres): before ingestion of glucose, 77; at half an hour, 124; at one hour, 132; at one and a half hours, 186; at two hours, 124.

FIGURE II.
The macroscopic appearance of the suprarenal tumour.

The patient's blood pressure (sitting) was 130/80 millimetres of mercury, and his pulse rate was 80 per minute. In the electrocardiogram the *T* waves in left ventricular leads had deepened. After five milligrammes of "Regitine", the blood pressure fell from 140/90 to 110/75 millimetres of mercury within two minutes. After 0·025 milligramme of histamine had been injected intravenously, the blood pressure fell from 125/90 millimetres of mercury to 80/60 millimetres in 30 seconds, rising to 120/90 millimetres four minutes later. He now excreted 50 microgrammes per litre of catechol amines.

The patient's subsequent progress has been highly satisfactory. He gained 10 pounds in weight during the two months after the operation. There were no further vasospastic episodes, and he stated that he now felt cold at times for the first time for 10 years. Three months after surgery his blood pressure was 120/80 millimetres of mercury, and his cardiac enlargement had disappeared. No arterio-venous "nipping" was visible in the retinæ. He had had a further attack of bronchitis with no sign of recurrence of his former symptoms.

Dr. V. McGovern examined the tumour and reported as follows (Figures II and III).

> Macroscopic: The specimen consists of a roughly spherical tumour 6 cms. in diameter. There is a thin rim of suprarenal cortex attached to half the circum-

ference of the tumour and from this attenuated cortical tissue can be seen covering the surface of the tumour for a short distance.

Microscopic: The tumour is composed of very large cells, irregular in shape, with a great variety of nuclear patterns. Many of the nuclei are hyperchromatic and have bizarre shapes; some cells are multi-nucleated. The cells in general appear to be arranged in an alveolar pattern and the tumour is very vascular. On cytological grounds the tumour should be suspected of malignancy. The appearance is that of a phæochromocytoma.

The interesting features of this case were the classical features of intermittent hyperadrenalism, the high leucocyte count and blood concentration, *plus* the long period of quiescence for ten years, terminated by exposure to cold weather or to malignant degeneration in the tumour.

Discussion.

The prognosis must remain uncertain in view of the histologist's report, but it would appear that no other active chromaphil tissue remains, and the patient's heart and renal function have recovered most satisfactorily. No explanation can be offered for the long period of latency in this patient's history, but it may be that the onset of malignant growth coincided with the abrupt appearance of enhanced symptoms. The absence of fixation of the tumour to surrounding structures leads us to hope that malignant cells had not pierced its capsule. Malignancy with metastasis is more common in the category with sustained hypertension.

The classical picture presented by this patient leaves little room for any other diagnosis. The similarity to acute hyperthyroidism exists only during the paroxysm, but heat intolerance is common to both disorders. Histaminic cephalalgia, migraine, hypertensive encephalopathy, coronary occlusion and severe anxiety states must be considered, but they are readily excluded. More phæochromocytomata occur on the right side than on the left; those on the left side may be associated with neurofibromatosis, but no evidence of this disorder existed in this patient. The pharmacological tests employed on this patient were of the depressor variety, as we felt that stimulation of the tumour by histamine would be risky. Care was taken to cease the administration of sedation or hypotensive drugs beforehand, and the high urinary values for catechol amines did not necessitate reexamination after stimulation of the tumour, nor was the determination of plasma values considered desirable. These tests can give falsely positive results in the presence of hæmolytic jaundice, lymphoma or renal insufficiency, and are therefore non-specific to some degree.

The developmental anomalies in the kidneys are considered to be coincidental, and they do not appear in the literature in association with phæochromocytoma.

Acknowledgements.

We express with pleasure our acknowledgements to Dr. K. Rawle, Dr. B. Pearson, Dr. F. Niesche, Dr. B. S. Clifton, Dr. J. MacRae, Dr. V. McGovern and the Baker Medical Research Institute, Alfred Hospital, Melbourne.

SURVIVORSHIP IN NEUROBLASTOMATOSIS: REPORT OF A CASE, WITH COMMENTARY.

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THE salient features of the history of an infant suffering from neuroblastomatosis are thought to warrant reporting for the following reasons: (i) the diagnosis was established by biopsy; (ii) the relatively large abdominal tumour responded to a course of radiotherapy to the extent that it could not be palpated afterwards; (iii) the patient, though extremely ill for five months, survived, and is at the present time (August, 1957), three years after diagnosis, a very healthy, robust child; (iv) the apparent recovery of the patient followed upon courses of radiotherapy (deep X irradiation) and chemotherapy (vitamin B_{12} in massive doses).

CLINICAL HISTORY.

The patient, an infant girl, aged 15 months, was admitted to the Goulburn Base Hospital on July 21, 1954. She was pale, thin, very irritable and often screamed as if in severe pain; her weight was 19 pounds five ounces, her temperature was 104° F., her pulse rate 138 per minute and respirations 26 per minute. Dr. Jean Wright found a large, firm, tender tumour which was oval in shape, and its longer diameter was placed transversely across the lower part of the abdomen (Figure I). Its lower border was palpable by rectal examination.

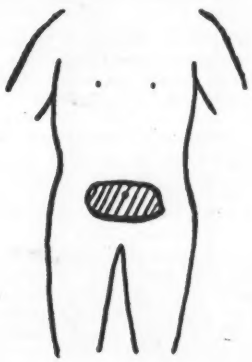

FIGURE I.
Diagram showing the relative size and site of the tumour.

On July 24 Dr. G. H. Kennett performed a laparotomy while the patient was under a general anæsthetic administered by Dr. K. P. Lyttle. A large, vascular, fixed, retroperitoneal tumour was seen extending across the posterior abdominal wall almost from flank to flank; its size was 12 centimetres by seven and a half centimetres by five centimetres. Because of its extent and fixity, removal was impracticable, and examination of the liver and adrenal glands was not feasible. A tentative diagnosis of retroperitoneal sarcoma was made and a section taken for biopsy. The report from the Pathological Laboratory, Department of Public Health, Sydney, was as follows:

Sections show the tumour to consist of a scanty hæmorrhagic fibrous stroma, supporting masses of rounded cells which vary somewhat in size. The nuclei of these cells are hyperchromatic and show frequent mitoses. Sometimes the cells are arranged in "rosette" formation. The tumour is malignant and the appearances are those of a neuroblastoma.

After the exploratory operation the child was *in extremis* for a week. X-ray examination of the skull, spine, lungs and long bones (Dr. A. L. Kennett) did not reveal any metastases—a most fortunate finding.

With careful nursing she slowly improved sufficiently to be taken to the Royal Prince Alfred Hospital, Sydney, where deep X-ray therapy was given. The estimated radiation dose on the tumour was 1500*r*, with field size 20 by 20 centimetres. Because of a persistently low white cell count, the therapy was spread over a period of 53 days. On completion of the X-ray treatment, the tumour could no longer be palpated; nevertheless the patient remained extremely ill.

When she was readmitted to Goulburn Base Hospital on November 25 she was pale, apathetic, inert but resenting interference, refusing food and drinks, and was apparently not in pain. Her temperature was 105° F. No physical signs of intercurrent disease were apparent. Empirically, "Chloromycetin Palmitate" was given without any improvement in her condition. The prognosis seemed to be hopeless.

At this stage an article by Wayne (1954) prompted the adoption of treatment with massive doses of "Cyanaco-

balamin" (vitamin B_{12})—1000 microgrammes given intramuscularly on alternate days. The article summarized the results of this type of chemotherapy, which was being carried out at the Great Ormond Street Hospital, London; namely, out of a series of 10 patients suffering from neuroblastoma (including some in a very advanced state), three were still alive after periods well in excess of the anticipated survival time (see Annual Report of the British Empire Cancer Campaign, 1953).

In the present case this treatment was commenced on December 3. Within a week the sister in charge (Sister D. R. Duncan) reported a definite improvement in the patient's condition; she began to take food willingly and soon lost her listlessness. To affirm that, from then onwards, "convalescence was uneventful" is no exaggeration, as may be judged from the weekly weight chart which reads in pounds as follows: 19·0, 19·5, 20·6, 20·9, 22·3, 22·9, 24·2.

Serial blood counts by Dr. A. R. Hazelton showed that the red cells remained about 4,000,000 per cubic centimetre and the hæmoglobin value was 70 per 100 millilitres. White cells, which totalled 19,000 per cubic centimetre originally, diminished to 8700 per cubic centimetre by January, 1955. Differential white cell count was characterized by a lymphocytosis; at first this was 76% of the total white cells, but it dropped to 43% in January. On December 19, 1954, she left hospital, a happy, smiling child who was learning to walk (she could not walk before admission).

As an outpatient her dose of vitamin B_{12} has been reduced to 1000 microgrammes per week. Regular follow-up examinations have failed to reveal any significant abnormality in an apparently normal, healthy child. At the present time (August, 1957), three years since she first reported, her weight is 39 pounds eight ounces; that is, her weight has doubled.

Tumours of the Sympathetic Nervous System and Adrenal Medulla.

According to the thirty-first annual report of the British Empire Cancer Campaign, 1953, "neuroblastoma is one of the commonest malignant tumours of childhood".[1] However, as it is rarely encountered in general practice, an account compiled from authoritative sources of this and other related tumours may not be out of place.

As the sympathetic nervous system and also the adrenal medulla are developed from the primitive neurectoderm, it is not surprising that both of these derivatives of the same embryonic origin may give rise to the same tumours. They may be classified as follows: (i) benign—ganglioneuroma; (ii) malignant—neuroblastoma; (iii) mixtures of the two—ganglioneuroblastoma. The distinction between benign and malignant tumours is a matter of the degree of differentiation of the neuroblasts which are the primitive progenitors of adult, mature, sympathetic ganglion cells. For completeness, it may be added that the medulla, in addition, gives rise to the remarkable chromaffin-celled tumour, or phæochromocytoma, which intermittently secretes large amounts of adrenaline and so produces episodes of acute hypertension.

Ganglioneuroma.

This benign variety is by far the rarer. It consists of well differentiated cells—a very close approximation to the normal sympathetic ganglion cells—with nerve fibres which possess sheaths. The tumour forms a rounded, encapsulated mass, not unlike a lipoma or fibroma (Dick and Illingworth, 1947), and like them may be very small or huge in size. Symptoms arise only by mechanical interference with neighbouring structures. According to its size and site, such a tumour may remain symptomless and harmless, perhaps to be discovered only in the course of autopsy on an aged subject. Weichselbaum reported such a tumour in a patient aged 76 years (Willis, 1953). Ganglioneuroma is not sensitive to radiotherapy (in this respect it differs from neuroblastoma), and the treatment, when necessary, is by surgical extirpation.

[1] Williams, Higgins and Bodian (1955) quote the results of a survey carried out at the Hospital for Sick Children, London, during the period 1930 to 1952. Out of a total of 390 malignant tumours, growths of the central nervous system accounted for 90, neuroblastoma for 82, nephroblastoma (Wilms's tumour) for 62, teratoma for 45, and the balance was made up by many less common types of growths.

Neuroblastoma (Sympatheticoblastoma).

The highly malignant form of sympathetic ganglion tumour is made up of very poorly differentiated, anaplastic, immature imitations of neuroblasts or sympatheticoblasts, which are, of course, the precursors of adult ganglion cells. Microscopically, diffuse masses of rounded cells with frequent mitoses can be seen. In some instances they may be seen to form, in places, characteristic circles or "rosettes", in the centre of which, like the spokes of a wheel, are immature fibrils without sheaths, which represent primitive nerve fibres.

Until 1910, when Wright drew attention to their specific structure, these tumours were considered to be round-celled sarcomata (Boyd, 1951). This is not surprising when one considers their resemblance in age incidence, the microscopic appearance of masses of small rounded cells and their clinical behaviour of extreme malignancy. In size, neuroblastoma may be so small as to be undetectable clinically, or relatively very large—as in the case cited. Moore (1951) states that 10% of neuroblastomata arising from the adrenal medulla are bilateral.

Age Incidence.

Both types of tumours are similar in this respect. Usually the patient is a baby or young child. Willis (1950) states that "about three-quarters of neuroblastomata appear before the age of four years. Adolescent and adult cases are rare."

Sex Distribution.

Most authorities agree that there is a slight preponderance in the number of female patients, but it is not sufficient to be of significance. In a series of 94 cases reported in the British Empire Cancer Campaign Report, 1954, 53 were females and 41 males.

The following tables, taken from the Central Cancer Registry of Victoria and Royal Prince Alfred Hospital, Sydney, are illustrative of these points.

TABLE I.

Anti-Cancer Council of Victoria: Central Cancer Registry. Age and Sex Distribution of 18 Cases of Neuroblastoma, 1946 to 1955.

Subjects' Age in Years.	Number of Cases.	Sex.	
		Male.	Female.
Under 1 ..	4	3	1
2	2	—	2
4	1	—	1
5	1	—	1
7	2	—	2
10	1	1	—
11	1	—	1
17	1	—	1
19	1	—	1
22	1	1	—
44	1	1	—
47	1	1	—
51	1	—	1
Total ..	18	7	11

Sites of Origin.

The two varieties of tumours—benign and malignant—and the mixtures of both may arise wherever there are sympathetic ganglion cells, but the commonest sites are the adrenal medulla and the sympathetic chains of the abdomen, neck and thorax—in that order. Contrary to expectation, these tumours are extremely rare (if, indeed, they ever occur) in the central nervous system (Willis, 1950).

Metastasis.

Dissemination of the malignant form takes place by way of the lymphatic vessels, the nodes and the blood-stream;

new growths often form very extensively in the liver, the bones, and particularly the calvarium with a predilection for the bones of the orbit. Pulmonary metastases are extremely rare according to Williams, Higgins and Bodian (1955). Commonly, the original tumour, which may be very small, is not suspected until long after the fast-growing secondary tumours have become apparent.

The greater frequency of liver involvement in cases of right-sided adrenal growths is only a matter of the proximity of the two organs, and skeletal metastases are equally common in right-sided and left-sided adrenal tumours; so the distinction between the syndromes of Pepper and Hutchinson is of no great significance (Williams, Higgins and Bodian, 1955).

Willis (1953) is of the opinion that many cases of Ewing's tumour arise from an unsuspected adrenal primary growth.

TABLE II.

Royal Prince Alfred Hospital, Sydney. Age and Sex Distribution of 17 Cases of Neuroblastoma, 1943 to 1957.

Subjects' Age in Years.	Number of Cases.	Sex.	
		Male.	Female.
Under 1 ..	1	—	1
1	3	—	3
2	2	1	1
3	1	1	—
4	1	—	1
6	3	3	—
9	3	2	1
12	1	—	1
15	1	—	1
51	1	1	—
Total ..	17	8	9

Symptomatology.

Bizarre is the appropriate attribute here. General symptoms of a severe systemic disorder, such as fever, anæmia, loss of weight, malaise and vomiting, are not infrequent. Indeed, for a considerable time they may be the only indication of the hidden condition.

Localizing signs are often those of the metastases and depend upon the invasion of, or pressure upon, various structures throughout the body; for example, paraplegia due to a dumb-bell shaped tumour pressing on the spinal dura, or bladder obstruction due to a growth in the pelvis. Not uncommonly metastases reveal themselves before the primary growth is detected or even detectable. Thus, in a baby presenting with an otherwise unexplained proptosis of an eye, an X-ray examination of the skull may reveal an early metastasis in the orbital bones, and a search for the primary origin in the adrenals or the sympathetic chain is indicated. Tumours of the cervical sympathetic, since they are more superficial, are discovered earlier than those of intrathoracic or abdominal origin.

Degree of Malignancy.

As a rule, neuroblastoma is a quick killer. Of 52 patients who died of neuroblastoma, reported from Great Ormond Street Hospital, London, which were reviewed in the twenty-eighth annual report of the British Empire Cancer Campaign (1950), the duration of survival after the onset of symptoms was four to five months on the average. Similarly, Phillips (1953), at the Memorial Hospital, New York, gives the length of survival as an average of 11 months in a total of 65 fatal cases. It is generally true that the degree of malignancy varies inversely with the age of the patient. In rapidly fatal cases in infants, "rosette" formation may be absent (Willis, 1953).

Spontaneous Regression.

Many observers record that neuroblastomata or mixtures of benign and malignant types, such as ganglioneuroblastomata, may in very rare instances undergo spontaneous cure, with no treatment whatever. In a survey of 64 cases at the Hospital for Sick Children, London, there were two instances of spontaneous regression (Williams, Higgins and Bodian, 1955). Phillips (1953), quoted by Willis (1953), found seven instances of this in a total of 613 cases reviewed. Again, partial removal by surgical means, or even needle biopsy, have been followed by disappearance of the tumour. The explanation may be that the undifferentiated cells undergo "maturation" to become differentiated, due to some unknown stimulus, or perhaps spontaneous necrosis provides the answer.

There is a very interesting article on maturation by Kissane and Ackerman (1955) of St. Louis, Missouri, in which they describe one case of their own and mention two others, all originally diagnosed by biopsy as neuroblastoma. After treatment with radiation of their own patient and that of Winslow, and biopsy only of Cushing and Wolbach's case, a second microscopic examination showed that the tumour in each case had "matured" to become a differentiated ganglioneuroma.

Whatever the explanation, this well recognized phenomenon of spontaneous cure provides grounds for scepticism in assessing claims of a cure by any therapeutic method.

Treatment of Neuroblastoma.

It was believed until comparatively recent years that no treatment was of avail. Then success by radical surgery was reported in a few isolated instances.

The recognition that this tumour is exceedingly radiosensitive (as quoted by Williams, Higgins and Bodian, 1955) is an advance of the greatest importance. Even metastases have been observed to disappear after radiotherapy. In recent years, survival has been recorded after the following methods of treatment have been performed alone or in various combinations: (i) surgical excision (even subtotal when total extirpation is not possible); (ii) radiotherapy in doses totalling from 1500 to 3000 röntgens, depending on the age of the patient (Williams, Higgins and Bodian, 1955); (iii) chemotherapy by the administration of vitamin B_{12}.

Vitamin B_{12} is under trial at the Hospital for Sick Children, London, where doses of 1000 microgrammes given intramuscularly every second day were originally given in the hope that it would provoke maturation. The treatment is being continued for two to three years. The exact mechanism by which B_{12} produces favourable results is not known. It is now believed that it is not a matter of provoking maturation; but since destruction of the tumour is the observed effect in successful cases, hæmorrhagic necrosis may be the process involved. The theory is tentatively advanced that this may be produced by direct interference with the metabolism of the tumour or "by inducing growth in excess of the available supply of nutrients and hence a necrotizing process" (see Reports of the British Empire Cancer Campaign for the years 1953, 1954, 1955 and 1956). These reports provide history and follow-up of each of the series of 30 cases, and reference may be made to them for much more detail than can be included in this article. A survival period of two to five years is reported in 25% of the series. This is all the more remarkable because several patients who died soon after admission with very advanced tumours were included in the total.

The 1955 report draws the following conclusion:

> The administration of vitamin B_{12} has, in our experience, led to a temporary or lasting arrest of tumour growth in nearly 50% of cases of neuroblastoma. The frequency with which the regressive phenomena have been noted renders it clear that this is a therapeutically induced, and not a spontaneous, effect.

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Hospital, Sydney; Dr. H. J. Ham and Dr. E. J. Hardcastle of Sydney, who carried out the deep X-ray therapy; and Dr. Robert Fowler of Melbourne for much helpful criticism and advice. The generous gift from the Knoll Laboratories, Sydney, of an amount of vitamin B_{12} in 1000 microgramme doses is also acknowledged.

ADDENDUM.

It is very pleasing to note that through the offices of the Commonwealth Minister for Health, vitamin B_{12} in doses of 1000 microgrammes is now available as a pharmaceutical benefit under the second schedule, for cases of neuroblastoma.

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BALANTIDIASIS.

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ACCORDING to the review and report of cases of balantidiasis by Victor M. Arean and Enrique Koppisch, by 1956 only 600 cases had been reported in the literature. They stated that *Balantidium coli* is probably the rarest pathogenic organism causing dysentery. The parasite was first discovered as a cause of disease in man by Malmsten in 1857.

The organism is of worldwide distribution. Arean and Koppisch note that the reported incidence of infestation varies enormously, and they attribute this to the various times that have elapsed between the collection and the examination of the specimens of fæces. There is no doubt that this is an important factor, but the variation in incidence must be real, if the ætiological factors responsible for infection in any given case are borne in mind. At this hospital, all fæcal specimens are examined at the time of collection, and the incidence of infestation with Balantidium is certainly not as frequent as the 5·1% incidence found by Stahenovitsh among the 2000 fresh stools examined by him while working in Khalnar, Azerbaijan (Persia). No case has been reported here during the past 10 years until the case this year. As will be seen later, it would appear that the infection was not acquired here, although the disease became clinically manifest on the island.

The ciliate is passed intermittently in the stool, and so it is essential that repeated stool examinations should be made when this condition is to be considered in the differential diagnosis. On account of the pathology of the disease, a rectal swab, particularly from any ulcers that may be present, may be expected to give a positive result in cases in which some difficulty is experienced with finding the organism in the stool. In any case, the collection of the specimen and its delivery to the laboratory are not left as the responsibility of the patient. Even after clinical cure it is prudent to carry out search for the organism in the fæces at, say, three-monthly intervals for a year.

The parasite is readily identified, and failure to make a diagnosis would stem more from not looking for the organism than from not being able to recognize it. Its most striking feature is the very active locomotion witnessed as the specimen is first brought into focus under the microscope; then one notices the relatively large size, from 30 to 150 microns long and 40 to 50 microns in width. (It should be noted that specimens up to 300 microns long have been reported.) The cilia, which cover the thin pellicle, are more difficult to see and can be more readily observed on the less motile parasites. Red blood cells are ingested, but they were not seen in the several specimens examined here.

The low incidence of this disease must be due to the ready destruction of the organism by the normal acid content of the stomach, and is further explained by the fact that infection is favoured by poor hygiene and under-nutrition, particularly in respect of protein intake. Alcoholism has to take its share of responsibility for the lowered resistance to the disease.

Epidemiology reveals that the hog, wild boar, sheep, horse, bovines, guinea-pig, fowl, turtle, cockroach, *Macaca mulatta*, orang-outang, baboon, chimpanzee and other animals act as the reservoirs for the disease.

Arean and Koppisch describe the clinical features of both acute and chronic forms, and what is even more important, they describe balantidial appendicitis, which one may reasonably suggest occurs more frequently than the few cases mentioned in their article.

The present position with regard to therapy is unchanged from that defined in 1956 by these authors, and "Terramycin" in doses of 500 milligrammes every four hours for 10 days would be the first choice for the average adult. Carbasone is still an effective alternative either alone or in combination with one of the iodine derivatives. In the one case under our care, carbasone alone succeeded when "Terramycin" had failed.

The following report of a case raises several important points, some of which have already been alluded to.

In July, 1957, a single woman, aged 33 years, presented with a complaint of frequent diarrhœa with pus in the stool. Nausea was also present, but there had been no vomiting. Clinical examination, including proctoscopy, revealed nothing more than some reddening of the rectal mucosa. Routine examination of the fæces with the low power of the microscope established the diagnosis. Numerous Balantidia were found.

The past history was interesting in that she had had an appendicectomy approximately 15 years earlier. Could this have been the first manifestation of the disease? This is possible, but it was not until four years ago that the patient first lived under conditions which favoured the infection. At that time she was working with natives in the Forrest River area of Australia, where hygiene was unsatisfactory and nutrition poor. A further hazard was introduced by the handling of toads incidental to her work there, and the latter animal is a known source of Balantidium. The circumstances were right for infection to occur, and this probably did take place, for the first attack of diarrhœa was experienced at Forrest River. The stools at this time contained pus, blood and mucus. The patient was in bed for two days and recovery followed treatment with injections. The contents of the injections are not known, and the causative organism was not identified at this time to the patient's knowledge. In 1954, a further attack of diarrhœa was experienced, but no doctor was available to provide treatment. Recovery occurred spontaneously.

The patient's health remained satisfactory until May, 1957, when she attended as an out-patient with a complaint of headache and malaise. Routine clinical examination at this stage showed no abnormality. Pressure of work could have been producing emotional fatigue and associated physical langour. This episode is mentioned for the sake of completeness, and any relationship to the last illness is debatable.

As stated earlier, the administration of "Terramycin" did not eliminate the organism, though there was some symptomatic

improvement, but not to the degree that there was freedom from diarrhœa. After 10 days a change was made to carbasone, which in due course led to a cure. At the time of changing the treatment, the patient was referred to Australia for a further opinion, as, without previous experience of this condition, failure to respond to "Terramycin" left us with some lack of confidence in carbasone effecting a cure. The interests of public health were also best served by taking all steps possible to guarantee control at the earliest possible moment.

In conclusion, one should point out that the main clinical significance of this history is the way in which it emphasizes the potential importance of any case of diarrhœa to the individual and also to the community that provides the immediate environment of the patient. In any part of the world, among the simple toxic diarrhœas and the bacillary dysenteries, are to be found the less common and occasionally the rare diarrhœal diseases, but when they occur they assume an importance out of all proportion to their numerical representation because of either chronicity, if undiagnosed, or unexpected virulence, or because of epidemic potential in an area which the disease has not previously invaded.

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Reviews.

Introduction to Protein Chemistry. By Sidney W. Fox and Joseph F. Foster; 1957. New York: John Wiley and Sons, Incorporated. London: Chapman and Hall, Limited. 9" x 6", pp. 472, with many illustrations. Price: $9.50.

THIS is a very good text-book concerned with presenting a comprehensive view of a large and rapidly changing section of biochemistry. Currently, the books on this subject are large and generally run to several volumes. The authors in this instance have made a sound selection of the material to be included in a relatively small book. In spite of the need, in a book on this subject, to include much reference material, the thoughful sequence of topics and a good style of writing have resulted in a book which is very interesting to read. Condensation of much material has not resulted in inaccurate generalizations. The book is clearly one for advanced students and graduates in either biology, biochemistry or chemistry. The title might suggest a narrowly chemical view of the subject; however, the necessary physico-chemical, organic and biological aspects of the proteins have been carefully interwoven.

There are twenty chapters, including three on blood proteins, notable protein systems and hormonal proteins. Commendably, the authors have avoided using much space on detailed methodology, the statements on technique being mainly indications of the principles and some comparisons. The selection of review and original reference literature is excellent. This book is recommended highly to advanced students in biochemistry whatever their background. Any serious student of medical science will also find it a good source of general information.

Noise and Your Ear. By Aram Glorig, jnr., M.D.; 1958. New York and London: Grune and Stratton. 8¼" x 5", pp. 160, with illustrations. Price: $6.50.

ARAM GLORIG is Director of the Research Centre of the Subcommittee on Noise in Industry of the American Academy of Ophthalmology and Otolaryngology at Los Angeles, California, and is recognized as a world authority on the problem of noise. In this concise and erudite work, which is the first of a series dealing with industrial medicine, Glorig covers the problem of hearing from many points of view.

The monograph, which is divided into seven sections, opens with a brief historical introduction to the problem of noise and hearing and the development of compensation law, and contains a valuable glossary of audiological and medico-legal terms. The author describes the anatomy of the ear, the theories of hearing and the problems of psychoacoustics, including the measurement of man's responses to sound. The section on audiometry is complete and clear, and should be of great value to all those who have to do with this particular aspect of the subject. A discussion of the various types of hearing loss, their interrelationship and their effects on both social and job activity is followed by a description of the effects of noise exposure, not only on the person but also on the community. Section 6 is a reprint of the "Guide for Conservation of Hearing in Noise" as issued by the American Academy of Ophthalmology and Otolaryngology in 1957. The final section on compensation and rating scales is an attempt to collate our present knowledge on this subject with the legal aspect. At the end of the work there are three appendices: a list of organizations whose activities are directly related to the problems of hearing loss and noise; a partial list of manufacturers of equipment; and a very good list of references for further reading for those who are more fully interested in the subject.

Although the author says that the book is not an exhaustive treatise, and that it is not intended for the expert, it nevertheless covers the whole subject so fully that it should form part of the library of all those interested in public health and preventive medicine and in the problem of noise in industry and, certainly, of all otologists. Each section is complete in itself, and the whole forms a valuable work of reference on the subject of noise, which is assuming greater importance in the life of the community.

Frazer's Anatomy of the Human Skeleton. Edited by A. S. Breathnach, M.D., M.Sc.; 1958. London: J. and A. Churchill, Limited. 11" x 7½", pp. 254, with 197 illustrations. Price: 50s. (English).

IT is refreshing to find that somebody on the St. Mary's Hospital anatomy staff is concerned to perpetuate the great reputation that the late Professor J. E. Frazer built up both for himself and for that school (of which he was the first professor of anatomy) in the earlier part of this century. This grateful task has been undertaken by Dr. Breathnach, Senior Lecturer in Anatomy at St. Mary's, in his revision of one of Frazer's best known works. The book dates back to 1914, and the last edition produced by Frazer himself was the fourth, published in 1940. That was reprinted in 1946, the year of Frazer's death, and again in 1948. It is now approaching its half-century, which, while no record for books on anatomy, certainly puts it in the "Classic" group. Nevertheless, subsequent work has necessitated a revision, and this Breathnach has accomplished with discretion and delicacy. Some of the text, particularly that relating to bone growth, has been brought up to date, and there are several textual changes elsewhere; but in the main most of the descriptive parts are as Frazer left them. The inclusion of a number of X-ray plates is welcome. Some illustrations are omitted, and a few are redrawn, while some explanatory legends are shortened. These minor changes are no great loss, since even Frazer's most ardent admirers would admit that not all his drawings are of equal clarity. In any case, the bulk are retained, including the most familiar and useful, and there is no doubt that the old master is still the guiding spirit. Frazer's unrivalled ability to clothe the bare bones and make them part of the body accounts for his success as a writer and teacher. The requirements for learning anatomy have not changed since his day, and current increasing demands for detailed anatomical knowledge make every possible aid to learning essential. "Frazer's Anatomy of the Human Skeleton" is one of the best of such aids, and it should be consulted by every student who really intends to master the subject.

Variation and Heredity. By H. Kalmus, M.D., Sc.D.; 1958. London: Routledge and Kegan Paul, Limited. Sydney: Walter Standish and Sons. 8½" x 5½", pp. 234, with many illustrations. Price: 28s. (English).

DR. H. KALMUS, lecturer on genetics in University College, London, has contributed this volume to the series "Survey of Human Biology". The medical reader is sometimes irritated by the stress laid on the fruit fly in genetic literature, but unjustly, for in the fruit fly the chromosomes are large (almost visible to the naked eye), straight and arranged in parallel order, whereas in the human being the chromosomes are small, coiled and difficult to examine. Again, generation succeeds generation in the fruit fly with a rapidity which is utterly unknown in the human. Further, the fruit fly can be subjected to experimental procedures, physical and chemical, which only unpredicted accident can inflict on human beings. Our highly evolved brain has a capacity for storing experience to be used in guiding our response to environmental change vastly superior to anything found in the lower animal, and this cerebral factor, based on memory, makes it most difficult to disentangle congenital from acquired characters.

All through this book the application of genetic laws to the human being is kept in the forefront. Dr. Kalmus lets us know that the clinician had made important discoverics in human heredity before Mendel's work became known and appreciated; thus the German Nasse in 1820 drew attention to the sex-linked features of hæmophilia, in 1826 Sagerat in France investigated eye colour and used the term dominant, and in 1861 Sedgwick surveyed eye abnormalities and showed that colour blindness is sex linked.

Every aspect of genetic law which can be put to use in studying the human being is here discussed calmly and is expounded with a commendable restraint in the use of the formidable vocabulary one finds in genetic literature. The handling of blood groups, including the Rhesus factor, can be warmly praised. Perhaps the greatest service this book can render is to caution the eugenist, especially the amateur eugenist, medical or lay, against dogmatism in recommending activities to improve the standard of human life. Thus we are told that erythroblastosis fœtalis could be abolished if Rhesus-negative people married only other Rhesus-negative people, and similarly if Rhesus-positive married only Rhesus-positive, but this would exclude six-sevenths of all husbands from being eligible for one-seventh of all women; such a restriction would be rejected, no matter by whom proposed.

The Relation of Psychiatry to Pharmacology. By Abraham Wikler, M.D.; 1957. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10" x 6¾", pp. 334. Price: 44s.

THE material in this book provides an extremely comprehensive review of a subject of growing importance both to clinical psychiatrists and to those whose main field of endeavour is research into the ætiology of mental illnesses and their treatment by pharmacological agents. The author has wisely confined himself to a consideration of those drugs of known potent effect—principally insulin, barbiturates, the amphetamine class of drugs, lysergic acid diethylamide, mescaline and some others.

The work is divided into two main sections. The first is concerned with effects of drugs on human behaviour, with special reference to therapeutic procedures, diagnostic and prognostic testing procedures, and the production of "model" psychoses. The second section deals with more theoretical aspects, biochemical, neurophysiological and psychological.

Although this is a field in which advances, during the last few years, have been made with surprising rapidity, the work is remarkably up to date. The bibliography on which it is based is extensive and contains 889 references. This book should find a place on the shelves of every medical library.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Reflexogenic Areas of the Cardiovascular System", by C. Heymans, M.D., and E. Neil, M.D., D.Sc.; 1958. London: J. and A. Churchill, Limited. 9¾" × 7", pp. 272, with 89 illustrations. Price: 56s. (English).

A monograph on the physiology of the cardio-vascular reflexes together with a consideration of pharmacological effects exerted on these mechanisms.

"The Strategy of Chemotherapy"; Eighth Symposium of the Society for General Microbiology held at the Royal Institution, London, April, 1958. Cambridge: Published for the Society for General Microbiology at the University Press. 9¾" × 5¾", pp. 170, with many illustrations. Price: 35s. (English).

A series of contributions, some speculative, on possible fresh ways of attacking microorganisms without damaging the host.

"Bridging the Gap: From Fear to Understanding in Mental Illness", edited by R. F. Tredgold, M.D., D.P.M.; 1958. London: Christopher Johnson. 8½" × 5½", pp. 272. Price: 30s.

This book is described as "an attempt to bridge the gap between the old attitude of fear and a newer attitude of understanding towards the mentally ill; and also the gaps between members of the psychiatric services and some of the more embittered and critical patients".

"A Comprehensive Dictionary of Psychological and Psychoanalytical Terms: A Guide to Usage", by Horace B. English and Ava Champney English; 1958. New York, London, Toronto: Longmans, Green and Company. 8½" × 5¼", pp. 608. Price: $8.00 (text), $10.75 (trade).

The title is self-explanatory.

"What is Your Problem, Mother?: A Common-Sense Approach to Motherhood and Child Care", by Clair Isbister, M.B., B.S., M.R.A.C.P., D.C.H.; 1958. Illustrations by Joan Abbott. Sydney, London, Melbourne, Wellington: Angus and Robertson. 8½" × 5", pp. 210, with many illustrations. Price: 21s.

Based on a series of broadcast talks given on the Women's Session of the Australian Broadcasting Commission.

"Man, The Peculiar Animal", by R. J. Harrison; 1958. Mitcham, Victoria: Penguin Books. 7" × 4¼", pp. 320, with 32 illustrations. Price: 7s. 6d.

A popular book on comparative anatomy and physiology.

"How to Write Scientific and Technical Papers", by Sam F. Trelease; 1958. Baltimore: The Williams and Wilkins Company. 7¾" × 4¾", pp. 200, with illustrations. Price: 35s. 9d.

"This manual is intended to meet the practical needs of students and research workers who are preparing illustrated papers or reports on scientific and technical subjects."

"A Manual of Electrotherapy", by Arthur L. Watkins, M.D.; 1958. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9" × 5¾", pp. 260, with 167 illustrations and one plate in colour. Price: 60s. 6d.

Based on portions of two earlier books by the late Dr. Richard Kovács.

"Neomycin: Its Nature and Practical Application", edited by Selman A. Waksman; 1958. Published for the Institute of Microbiology by The Williams and Wilkins Company, Baltimore. 9" × 5¾", pp. 414. Price: 55s.

A full statement about an important antibiotic.

"Proceedings of the Sixth International Congress of the International Society of Hematology, Boston, August 27-September 1, 1956"; 1958. New York: Grune and Stratton. 10" × 6¾", pp. 952, with many illustrations. Price: $25.00.

The title is self-explanatory.

"Ocular Allergy", by Frederick H. Theodore, M.D., and Abraham Schlossman, M.D., with chapters by William B. Sherman, M.D., and Robert S. Coles, M.D.; 1958. Baltimore: The Williams and Wilkins Company. 9" × 5¾", pp. 440, with 111 illustrations. Price: £6 12s.

The authors' aim has been "to correlate and classify the clinical manifestations of ocular allergy in accordance with the various allergic mechanisms involved".

"Practical Pediatrics", by R. Cannon Eley, M.D., and Benjamin Kramer, M.D.; 1958. New York: Landsberger Medical Books, Inc.; distributed by The Blakiston Division of the McGraw-Hill Book Company. 8" × 5", pp. 320. Price: $7.00.

Pædiatrics for the general practitioner.

"Anatomy and Physiology for Nurses", by W. P. Gowland, M.D., F.R.C.S., and John Cairney, D.Sc., M.D., F.R.A.C.S.; Fifth Edition; 1958. New Zealand: N. M. Peryer, Limited. 8½" × 5½", pp. 536, with 204 illustrations (including several in colour). Price: 45s. (New Zealand).

Written especially for the student nurse.

"The Matrix of Medicine: Some Social Aspects of Medical Practice", edited by Nicolas Malleson, M.D., M.R.C.P.; 1958. London: Pitman Medical Publishing Company, Limited. 8½" × 5", pp. 354. Price: 67s. 6d.

A series of studies, primarily by ordinary clinicians rather than sociological experts, into several different borderlands between medicine and society.

"The Examination of Waters and Water Supplies", revised by Edwin Windle Taylor, M.A., M.D., B.Ch., M.R.C.S., L.R.C.P., D.P.H.; Seventh Edition; 1958. London: J. and A. Churchill, Limited. 10" × 6", pp. 852, with 51 illustrations. Price: £5 (English).

The first edition of this book appeared in 1904.

The Medical Journal of Australia

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STYLE AND THE PREPARATION OF A MEDICAL PAPER.

ONE of this year's important but lesser known centenaries is that of the birth of H. W. Fowler, author of "A Dictionary of Modern English Usage". With his younger brother, F. G. Fowler, he compiled "The Concise Oxford Dictionary" and "The Pocket Oxford Dictionary", and together they wrote "The King's English"; but H. W. Fowler's memorial is "Modern English Usage". Since its first appearance in 1926 this book has greatly influenced the writing of English and has, we dare to say, done nothing but good. It is, of course, neither infallible nor eternally valid. Indeed, since its author died in 1933 and no one has produced a subsequent revised edition, its contents cannot now live up to its title; and one may be sure, from Fowler's robust common sense and constant emphasis on the living character of English, that he would be the last to claim either passing or permanent infallibility. The lasting qualities of "Modern English Usage" are well summed up by Harold Nicholson:[1]

> It is a work which expands knowledge and provides unfailing amusement; it is one of the best bed-side books that I know; and it teaches us to be tolerant of the literary eccentricities of our contemporaries and to condemn nothing except pedantry and affectation.

Harold Nicholson goes on to point out that the Fowler brothers rightly laid it down that language was no static body of laws or enactments, but a living organic form of expression which must continually refresh itself with new forms of speech and year by year borrow new words and phrases from foreign countries. "They contended that language had been accorded to us in order to enable us to convey our thoughts to others, and that in its very essence and origin it needed to be clear, simple and easily understood." This is the first lesson in literary style.

Admittedly, much writing that is acceptable and that unquestionably has style is not clear, simple or easily understood. The prose artist and the poet may be elaborate and complex, even obscure, in their writing if they know what they are doing. They use their words and phrases as the painter uses his colours, attempting to convey ideas and feelings that are not easily communicated; for this they are conceded greater freedom, the results being on their own heads. Most of us are not so privileged. Paul Chadburn[2] has put it well: "A scientist, a teacher, a newspaper reporter, a civil servant, all those who write for practical purposes, do not write well unless each thought, each fact, can be readily seized and completely assimilated by the reader's mind. . . . Such are the writers that most of us must aspire to be, writers of correct, easy English for practical ends, an idiom that will ensure our being understood and not misrepresented." Such are those who would write articles for medical journals.

This "correct, easy English for practical ends" need not lack grace. The recording of a scientific experiment, the explanation of a mathematical formula, the reporting of the results of laboratory tests, these and much more that appears in medical articles require baldness. But descriptive writing allows more freedom; it may be lightened and enhanced for its purpose by the fitting use of literary devices. It is never improved, in scientific value or otherwise, by the employment of crudities, or of the uglier forms of jargon, or of poor grammar. Readers are entitled to expect educated writing from medical authors, members of what Osler called, in the language of his day, "the profession of a cultivated gentleman". They are entitled to expect that facts and ideas will be clear in a writer's mind before he commits them to paper, and that he will try to express them in the best and most appropriate words. This is just a matter of good manners, but, as Sir Arthur Quiller-Couch has said,[1] "Style in writing is much the same thing as good manners in other human intercourse". We must consider the reader and put ourselves in his place if we are to communicate with him effectively. We shall then see that it is rather cheap to offer him unreliable data or muddled ideas; that it is presumptuous to expect him to understand our personal jargon words and phrases and our unorthodox abbreviations; that it is offensive to confront him with crudities of expression and the ambiguities inseparable from faulty grammar and sentence construction.

Another essential in preparing a medical paper is to set it out in a clear and orderly way. It should have a beginning, a middle and an end—a statement of the apparently obvious, which is justified by the number of papers which seem to start in the middle and end nowhere in particular. An author needs to know what his object is in writing a paper and to say so briefly; then to present his material; and finally to round it off with such conclusions and comments as he is able to put forward, together with an informative summary. There is much to be said for following closely the few formal patterns that cover most medical papers. For example, the report of a laboratory investigation usually falls readily into the following sections: Introduction, Materials and Methods, Experiments and Results, Discussion, Conclusion (sometimes), Summary, Acknowledgements, References. A convenient subdivision for a clinical report is as follows: Introduction, Clinical Record, Pathology and Special Reports, Discussion, etc. These are simple patterns, but, adapted and sometimes elaborated according to circumstances, they usually serve very well; even for subject matter which requires different headings they illustrate the orderly approach. It is surprising how many writers of papers depart from them, or from the principles illustrated by them, to their own and their readers' confusion.

[1] *The Listener*, 1958, 59 : 619 (April 10).

[2] "Good English : How to Speak and Write It", Oldhams Press, 1949 : 179.

[1] "On the Art of Writing", Guild Books, 1946 : 164.

Finally, the medical writer should consider the journal to which he plans to submit his paper. Editors and their staffs are human, and their reaction to a paper is influenced by its appearance and by the way in which it is written, as well as by its content. The good manners necessary to its literary style should be extended to its general layout, to its typing and presentation, and to its conformity to the particular requirements or style of the journal to which it is offered. Every journal has its own standard practices and conventions for the presentation of papers, the setting out of references and other details; these are usually mentioned in an editorial notice in every issue of the journal (ours appears at the end of the last page of reading matter), or may be learned from perusing articles printed in the journal. An editor is glad to clarify any points about presentation that remain obscure in the author's mind, but prefers to do it before rather than after the submission of the paper. It is easier then for him to remain on friendly terms with his contributors.

AUSTRALIA'S ANTARCTIC DOCTORS.

In spite of a good deal of somewhat confusing publicity (confusing because, to the average reader, mention of the Antarctic probably conjures up a jumble of Sir Vivian Fuchs, I.G.Y., New Zealanders and American snocats, most of which has no close connexion with the Australian Antarctic effort), most people are still very vague about the part being played by Australians in Antarctica. We therefore offer no apology for a brief recapitulation. At present the Antarctic Division of the Department of External Affairs maintains three bases: one at Macquarie Island, situated approximately half-way between Hobart and the Antarctic coastline; one at Mawson, on the Antarctic coast some 3000 miles south-west from Fremantle; and a small subsidiary base at Davis, 300 miles east of Mawson. At the beginning of 1959, Australia will also take over Wilkes Base, established two years ago by the Americans, nearly 2000 miles due south of the Australian Bight. Each of these bases is manned by a party of men who go for a year at a stretch, during which time their only communication with the outside world is by radio (Macquarie Island occasionally receives a visit from passing expedition ships of other nationalities). The size of the party varies according to the establishment of the station and the programme for the year. In 1959 it is planned to have 16 men at Macquarie Island, 18 at Wilkes base, and over 20 at Mawson (this includes a contingent of the R.A.A.F.). At each of these stations it is necessary to supply a doctor (the small group at Davis is in limited air communication with Mawson), and applicants for the post at Macquarie Island and at Wilkes Base are at present being sought.

It often seems a pity that the great majority of young graduates are in such an urgent hurry to find a niche for themselves in the profession of their choice that they neglect the many interesting doors which the possession of a medical degree opens to them, and this is an example. We venture to say that few who take advantage of such wayward opportunities regret it in later years. The reasons which take men to the Antarctic are many and various: scientific curiosity, the search for adventure, or maybe the opportunity of saving a year's salary. However, a year in the Antarctic is not everybody's cup of tea. To be a successful Antarcticist demands a certain independence of spirit and a degree of self-sufficiency despite the amenities and comfort of a modern Antarctic station. The real problems are the inter-personal relationships in a small community isolated for prolonged periods, and a good medical officer can play an important part in maintaining a good standard of morale. The work of looking after the health of a small party of fit young men is not exacting, but the job is, nevertheless, a very necessary one. This is not only because of the necessity of having professional skill available in case of emergency; at some time or another the doctor will be consulted by nearly every member of the party. The points are usually trivial, but without competent reassurance they could be the seeds of future anxiety. However, this does not keep him busy, and the doctor is expected to take his share of the general duties in running the station, and is encouraged to take part in some kind of scientific work, either, for example, physiological investigations of his own choosing, or biological field work, a department which depends largely on the interested amateur.

In the past it has not always been easy to find candidates for these posts, but it is to be hoped that young Australians will always be found who are prepared to stray for a short period from the narrow lines of an orthodox career, for not only do these posts provide opportunities for unusual and rewarding experience, but the work of these stations is of national importance. This is not the place to discuss the whys and wherefores of Antarctic research, but it should suffice to say that the work of these stations is making a material contribution to Australia's growing scientific reputation. A word of warning should be added. Scrutiny of the names of those who have manned these Antarctic and sub-Antarctic stations during the past decade reveals an unmistakable trend. Those who go once to the Antarctic tend to go again.

Current Comment.

PAN-PACIFIC REHABILITATION CONFERENCE.

"Conquering Physical Handicaps" is to be the theme of the Pan-Pacific Rehabilitation Conference to be held in Sydney from November 10 to 14, 1958. This will be a regional conference of the International Society for the Welfare of Cripples, a world-wide federation of voluntary national organizations in 36 countries, which was established to help the physically handicapped to become useful and happy citizens. To disseminate new concepts and techniques of rehabilitation and to facilitate the free exchange of research findings and opinions, the Society sponsors regular world congresses, regional conferences and special seminars for those persons, both lay and professional, working with governmental and voluntary organizations, who are concerned with rehabilitation. The present conference is the first of its kind to be held in the Pacific and South East Asian area. Organized by the Society's affiliated national organization in Australia, the Australian Advisory Council for the Physically Handicapped, it is being planned for all members of the rehabilitation team—medical practitioners, educationalists, therapists, nurses, social workers and those engaged in the vocational training and employment of the handicapped throughout the Pacific area and beyond. The preliminary

programme and other details are published elsewhere in this issue. The medical committee, under the chairmanship of Dr. Selwyn Nelson, is still working on the programme, and it is intended that there will be a number of sessions of interest for every professional group attending the Conference. The long list of distinguished people from England and the United States who have accepted the invitation to attend the Conference provides a guarantee of the high standard to be maintained.

PROBLEMS IN AVIATION MEDICINE.

DEVELOPMENTS in modern aircraft and increasingly ambitious flying programmes bring many problems to those concerned with aviation medicine. Some of these were brought forward in papers by Surgeon Rear Admiral L. Lockwood, by Squadron Leader J. McC. Morrison and by Wing Commander W. L. Rait at the Australasian Medical Congress earlier this year.[1] They are also discussed by Major J. Horak,[2] Assistant Surgeon-General (Air) of the South African Union Defence Force, in a paper presented to the South African Medical Congress in 1957. The most critical problems in aviation medicine are concerned with the hazards connected with very high flying and high speeds. There are definite physiological limits which may not be exceeded. Increased speeds and acceleration introduce some interesting problems in reaction time. Two hypersonic aircraft flying at 1800 miles per hour (about one mile in two seconds) will have a closing speed on a collision course of 3600 miles per hour. Even under the best conditions of visual activity it would be impossible for the pilots to avert a collision, for in the sum of the lag periods of perception, recognition and action the planes would have collided. Putting it another way, pilots of two aircraft flying at superonsic speeds in opposite directions and emerging suddenly from clouds may see each other only after they have passed. To a certain extent the effects of acceleration have been overcome, but the latest anti-G suit will increase the natural tolerance of the pilot by only about 30%. Another important aspect of high-speed flight is the production of excessively high temperatures as a result of heating due to friction and air compression. Thus at 600 miles per hour the rise in temperature is 30° C., and it increases as the square of the speed. Up to a point this effect may be controlled with elaborate refrigerating systems.

Escape from aircraft after accidents offers many problems. The use of the latest ejection technique and equipment has now made it possible to eject safely at very high speeds. Leaving the aircraft safely is, however, only half of the problem. At high speeds wind-blast effects are met with, causing very abrupt decelerations. At 500 miles per hour the impact pressure of wind blast at sea level is equal to 4·4 pounds per square inch, or about 3200 pounds on the total body surface. At 1000 miles per hour the pressure on the body in the seated position is 12,500 pounds. Pilots have survived such pressures in supersonic ejections with relatively minor injuries. Tests are being made with capsule types of ejection apparatus which have many automatically controlled devices to protect the pilot.

The greatly reduced pressure of oxygen at high altitudes also presents many problems. Inadequate oxygenation of the tissues as a result of this reduced partial pressure of oxygen sets up a syndrome—hypoxia. Up to a certain height these symptoms can be prevented by administration of oxygen at normal pressure. However, the phenomenal rates of climb of turbo-jet aircraft can expose the pilot to these symptoms in such an alarmingly short space of time that, despite the fact that the hypoxia symptoms occur only at about 10,000 feet, it is now imperative to use oxygen from the ground up. Aircraft can now easily reach altitudes where the total air pressure is less than the partial pressure of oxygen necessary for the needed 90% to 95% oxygen saturation of the blood. The critical height is 34,000 feet. At this height, the pilot breathing pure oxygen can just keep the alveolar pressure about normal. Above this, symptoms of hypoxia will occur when the pilot is breathing pure oxygen. To overcome this, oxygen is delivered to the lungs under positive pressure equivalent to eight inches of water. With this one can go up to 52,000 feet; but as the respiratory cycle is reversed, with passive inspiration and expiration against pressure, this becomes very tiring, and there is danger of rupture of the alveoli. This pressure breathing then cannot be kept up for long, but it is useful in emergency.

At altitudes above 30,000 feet a condition called dysbarism or decompression sickness is liable to affect an air crew, especially if they stay up there for several hours. This is similar to decompression sickness after deep sea diving and is due to escape of gases normally held in solution in the body fluids. This is a very dangerous condition, for spontaneous recovery is not possible, and in severe cases the outcome is usually fatal. For this reason, among others, modern aircraft flying at heights in excess of 50,000 feet are pressurized. This is not the complete answer to high flying dangers. At heights between 60,000 and 70,000 feet the aircraft will encounter the ozone layer, and ozone in the cabin in concentrations of more than six parts per million under pressure of 2·7 pounds per square inch has fatal toxicity. Should cabin pressure be lost for any reason, explosive decompression will result; so that all the gases trapped in the gastro-intestinal and other cavities, as well as in the tissue fluids and blood, will expand in a very short time to 14 times the mean sea level volume at 50,000 feet. At an altitude of 63,000 feet the total barometric pressure is only 47 millimetres of mercury, and exposure at this altitude will lead to boiling of the blood and filling of the lungs with steam. The only possibility of going beyond this height is in completely sealed vessels. However, the difficulties mentioned and others are being overcome, and no doubt man will some day fly into outer space.

[1] M. J. AUSTRALIA, 1958, 1: 850, 852, 853 (June 21).
[2] *South African M. J.*, 1958, 32: 443 (April 26).

ADVICE FOR THE FARMER WITH HEART DISEASE.

AN interesting example of constructive educational literature for the patient is provided by a new guide published by the American Heart Association and its affiliates. The guide, a 12-page booklet, classifies many common jobs on the farm according to the amounts of energy they demand, grouping the jobs into three basic categories: light, moderate and heavy work. It also contains a nine-point check list to help to conserve energy. Entitled "A Safe Work Load for Farmers with Heart Disease", the guide is designed to help the farmer and his doctor plan together a work "prescription" that is within the patient's capacity. It is available from the American Heart Association, 44 E. 23rd Street, New York 10, N.Y.

The booklet points out that determining the safe work load for an individual involves many more factors than merely knowing the energy demands of a particular job. Age, health, body build, job experience, state of mind and weather must also be considered. "Work and moderate exercise", the booklet states, "are good for almost everyone, including people with heart disease. But it is important not to overload the equipment. This applies to the farmer as well as to the farm machinery." The rate of work is important. A farmer may find that he can safely do a job that would ordinarily be too hard for him simply by doing it at a slower pace. "A slow, steady rate of work, with short rest periods, will get the job done without doing you in. When your work makes you short of breath or causes chest pain, either you are working too fast or the work is too hard for you." The booklet advises the farmer with heart disease to see his doctor whenever a job that he is accustomed to doing easily seems difficult or causes discomfort. The following nine points are listed to help the farmer save his energy and do his job: (i) Work at the steady, unhurried pace that suits you. (ii) Take plenty of short rests. (iii) Do not strain yourself in emergencies.

Get help or wait until you can be helped. (iv) Use your head to save your heart by planning an easier way to do the job. (v) Keep physically fit all the year round. Start on a new job slowly and give yourself time to become adjusted to the work. (vi) Keep an eye on the weather. Do not try to do as much work in hot, humid weather as you do in cool weather. (vii) Take your age into account. Do not expect to put out as much energy at 50 as you did at 25. Use the know-how you have acquired to make up for reduced physical capacity. (viii) Keep your weight normal. Do not drag around extra pounds. (ix) Learn to handle emotional stresses. Remember that help is usually available. "If you are worried about your health, discuss it with your doctor", the booklet advises. "If you are worried about farm problems, talk them over with someone who can help you—a good friend, or your county agent. It may help you to discover that your problems are not very different from those others have faced—and solved."

"A Safe Work Load for Farmers with Heart Disease" is based on a series of studies being conducted at the Agricultural Experiment Station, Purdue University, Lafayette, Indiana, and at a number of nearby farms. Known as the Purdue Farm Cardiac Research Project, it was begun in 1954. The research has been supported by the American Heart Association, Indiana Heart Foundation, the Indiana State Board of Health and Purdue University. Taking part in the project, under the leadership of Dr. L. S. Hardin, Dr. W. H. M. Morris and Dr. J. E. Wiebers, are physicians, agricultural engineers, physiologists, economists, sociologists and statisticians.

NUTRITIVE VALUE OF PROTEINS.

THE problems of protein, its quality and quantity, for animals, including man, are of importance in every country, but particularly in the poorer countries where protein is short in supply and poor in quality. It is necessary to know the nature and the amounts of protein-rich supplements which should be added to the poor basic diets in order to prevent protein malnutrition. Earlier ideas of nutrition divided proteins into first class, which included most of the animal proteins, and second class, which included the vegetable proteins. With increasing knowledge it became clear that it was the amino-acid composition of the protein which was important. The distinction between animal and vegetable proteins is now known to be neither rigid nor always justified.

In October, 1957, the Nutrition Society held a symposium in London on "The Nutritive Value of Proteins". Six papers were given on different aspects of the subject, and these have now been published.[1] They present very fully the present knowledge on the requirements. Kathleen Henry and S. K. Kow discuss general considerations. They state that the value of a food as a source of protein is determined by the concentration of protein in it, the digestibility of the protein, the availability of its amino acids for the synthesis of tissue protein, and its amino-acid pattern, particularly the content and proportions of the essential amino acids. Many biological methods have been devised for assessing the value of a protein as a food taking into account all these factors. A. E. Bender discusses these methods, and it would seem that the most useful index is still that devised by K. Thomas and improved by H. H. Mitchell. This is the biological value, which was defined by Mitchell as the percentage of absorbed (digestible) nitrogen retained by the body, the endogenous nitrogen losses being allowed for in the calculation. This sounds simple, but is really a very complicated determination. Proteins are composed of some twenty amino acids, and eight of these are called essential amino acids because they must be present in the food in adequate amounts; they cannot be synthesized by the animal or are synthesized too slowly. Any consideration of protein value presupposes that the energy requirements are fully met by ingested fat and carbohydrate. Some animal proteins are very close to perfect, having a biological value of nearly 100, which shows that they are almost completely utilized. Egg white is such a protein food, so this can be used as a standard.

Useful as they are, biological values of simple proteins do not tell the whole story. We do not normally eat single proteins; we eat mixtures of protein. One protein can supplement the deficiencies of another protein, so that a mixture of a relatively poor protein with a protein with a high biological value may have a biological value as high as or even higher than the better protein. Thus white bread protein has a biological value of 52, while that of cheddar cheese is 76, but a mixture of one part of cheese to 3·4 parts of bread has a biological value of 76. Potato has a biological value of 71, that of skim milk is 87, while a mixture of one part of skim milk with 1·3 parts of potato has a biological value of 86. To get the best results the proteins must be eaten at the same meal. In giving milk as protein supplement to young women, more nitrogen is retained if the milk is divided evenly over three meals and not all given in one or two meals.

The effect of heat on the nutritive value of proteins has been much discussed. Some foods have a higher protein value after they have been heated. This applies to egg-white, soya-bean meal and certain legumes, for the heating destroys a trypsin inhibitor in each. Roasting, braising and pressure cooking have little or no effect on the biological value of beef proteins. Of course, if the heating is too high or too prolonged, some destruction takes place. This is seen in some prepared breakfast foods. Storage can cause loss, particularly in dried milk.

In another paper from the symposium, K. J. Carpenter discusses the chemical methods of evaluating protein quality. The most interesting is the determination of lysine and the demonstration that lysine may be bound in such a way that it is unavailable because it is not set free during digestion of the protein. B. S. Platt and D. S. Miller discuss "The Quantity and Quality of Protein for Human Nutrition". They point out that Terroine has emphasized the distinction between the physiological requirement (the minimum amount of protein that will maintain nitrogen balance) and the hygienic requirement (the amount needed under the stresses of everyday life). The former can be defined with precision, the latter is at present a matter of guess-work. In other words we do not yet know the margin of safety. So many factors come into the consideration of human diets as compared with those of laboratory or commercially produced animals. In some human dietaries better protein utilization might be achieved by increasing the ingestion of carbohydrate or fat or both, thereby inducing protein-sparing action. Vitamin and mineral intakes also have effects on biological values of proteins. Protein is needed both for growth and for maintenance of the tissues, and these have different requirements, particularly in the amounts of individual amino acids. The very young child, the adolescent and the nursing mother have relatively high protein needs in relation to total calorie intake. These are being intensively studied. It is to be stressed that the paramount property of a good diet is the adequate level and balance of all of the nutrients. Menu value of foods is as important as quality. "Though the fields of human and animal nutrition have much in common and efforts in both can be mutually beneficial, there are differences in aims and interests which should be clearly recognised and—may we say—respected."

[1] *Proc. Nutrition Soc.*, 1958, 17: 78.

AN INTERNATIONAL JOURNAL OF HEALTH EDUCATION.

THE International Union for Health Education of the Public has produced a new journal called the *International Journal of Health Education*. The Union describes itself as a non-governmental organization whose aim is to contribute to the development of health education throughout the world. It accepts to membership national committees, societies, associations or other national voluntary health

agencies whose aims include health education of the public. Individuals can become associate members, as can foundations, universities, colleges, schools, museums, societies, associations and clubs, as well as unions, business firms or corporations desiring to assist the work of the Union. To achieve its aims the Union proposes: (i) to promote the creation of national committees for health education of the public and of national societies of health educators; (ii) to establish a bond between organizations working in the field of health education; (iii) to facilitate the exchange of information and of experience gained in various countries on all matters relating to health education.

Not surprisingly such an organization has felt the need for an official organ, and has founded the *International Journal of Health Education*, which is stated to be the first international health periodical to be published. It is printed quarterly in English and French editions. Its aim is to facilitate the exchange of experiences, ideas and news on health education and to bring to health workers and health education specialists throughout the world practical information which they can use in their work. It covers the following sections: health education in practice; professional training in health education; studies in research; methodology; international achievements; national reports. The subscription to the journal is twelve Swiss francs or one pound sterling per year. Inquiries regarding the journal should be addressed to the Editor, 3 Rue Viollier, Geneva, Switzerland.

The first number of this new journal, which is dated January, 1958, contains a message of commendation from the Director-General of the World Health Organization. The opening article, which is by Dr. John Burton, Medical Director of the Central Council for Health Education in Great Britain, is entitled "Doctor Means Teacher", and deals with the responsibility of doctors, nurses and others in the task of enlightening the public in health matters. The remaining articles come from all over the world, providing information of what is being done in health education and how it is being effected in various countries. The pooling of experiences of this kind cannot help but be valuable, and the journal should be most useful to a variety of people who are concerned with the health education of the public.

DEATHS FROM ALCOHOLISM AND CIRRHOSIS OF THE LIVER.

DEATHS from cirrhosis of the liver are on the increase in nearly every country for which statistics are published in the *Epidemiological and Vital Statistics Report*[1] of the World Health Organization. It appears that they represent 70% to 80% of all deaths due to alcoholism. Alcoholism itself as a cause of death remains on the same level (this category includes alcoholic psychosis, acute alcoholism and chronic alcoholism) and even shows a decline; for instance, in the United States it decreased from 1·7 per 100,000 in 1950-52 to 1·3 in 1955. It is on the increase in France, rising from 6·2 per 100,000 in 1950-52 to 10·6 in 1955. The rate in England and Wales remained constant at the low figure of 0·1 per 100,000. The figures given for Australia are 2·7 per 100,000 in 1950-52 and 2·4 in 1955; these are higher than those for the majority of countries listed, being exceeded only by Portugal, Switzerland and France, but the figures for different countries may not be strictly comparable.

Mortality from these two causes of death is higher among men than women, being three to four times higher for alcoholism and almost twice as high for cirrhosis, and occurs mainly among the elderly. Alcoholic mortality reaches its peak in persons between the ages of 40 and 69 years and decreases thereafter, while mortality from cirrhosis increases regularly with age and remains at a high level in members of the age-group 65 to 70 years and after.

Alcoholism is now regarded in many countries as a top public health problem, and as such it is being investigated by the World Health Organization. It is believed, however, that statistics cannot give a true picture of the extent of this problem. For one thing, there are no data on the incidence of alcoholism—that is, on the number of cases. Even the number of deaths attributed to alcoholism or cirrhosis of the liver cannot be held to give the total mortality from this cause because alcoholism is either the direct cause or a contributing factor in many deaths which appear under various statistical chapters—for instance, accidents, suicides and homicides, as well as several diseases. For this reason, the WHO report must be considered as giving only a fragmentary picture of mortality from alcoholism and does not permit accurate comparison between countries; it indicates only the trends of mortality from this cause within a given country in recent years.

[1] *Epidemiol. & Vital Statist. Rep.*, 1958, 11: 135.

SMOKING HABITS AND MORTALITY.

IN 1936 N. M. and E. L. Kennaway[1] recorded an association between occupation in the tobacco trade and a high death rate from cancer of the lung. H. F. Dorn and W. S. Baum,[2] in a study on the employees of the American Tobacco Company, noted that there were six deaths from cancer of the respiratory system and 38 deaths from other forms of cancer, as against expected numbers of seven and 53 respectively. For all causes, they found 338 deaths against an expected 500 deaths, using for the expected deaths rates from the general population in Virginia. Now H. B. Haag and H. R. Hanmer[3] have shown that these employees do in fact smoke, as Dorn and Baum[2] had assumed, more than the average Virginian. They have used similar methods for a later period and find that there were 10 deaths from cancers of the respiratory system, as against 10 expected, and 37 deaths from other cancers, as against 51 expected.

Deaths from cardio-vascular disease were also low—104 observed, as against 137 expected; but so were those from all other causes—90, as against 152 expected. Now this means that working in a tobacco company does not increase one's chance of dying from cancer of the respiratory system, but also that in some unexplained way the same work diminishes the chances of dying from other causes, such as violence and accidents, diabetes and infections. So, before the conclusions of Haag and Hanmer can be accepted, these incidental findings must be explained, or at least it must be shown that the population initially was not selected, that term being used in the statistical sense. Moreover, we should like to see whether in this population the non-smokers enjoyed any better mortality experience than the smokers.

R. A. M. Case[4] has criticized the work of Haag and Hanmer on another count. Given that the expected number of lung cancer deaths was four, then random sampling errors or chance factors could result in any number of observed cases from zero to eight; so that in any case the observations are not sufficiently extensive to give us an answer. J. Berkson[5] has discussed certain fallacies that arise in surveys of this kind and perhaps over-stated his case—namely, that there were at that time no studies available in which the effects of selection could be eliminated. We may await, as he implies, further studies on the population enrolled by the American Cancer Society, already reported on by E. C. Hammond and D. Horn,[6] and hope that they will be repeated elsewhere. As Berkson notes, and as various life insurance companies have found, the effects of self-selection and other initial biases can be expected to be non-operative after three or four years. Finally, we may express the view that, in the present state of knowledge of the cause and prevention of lung cancer, the recommendation stands that heavy smoking should be avoided and that public health measures should be taken against air pollution, wherever these are feasible.

[1] *J. Hyg.*, 1936, 36: 236 (June).
[2] *Indust. Med. & Surg.*, 1955, 24: 239 (June).
[3] *Indust. Med. & Surg.*, 1957, 26: 559 (December).
[4] *Nature*, 1958, 181: 84.
[5] *Proc. Staff Meet. Mayo Clinic*, 1955, 30: 319 (July 27).
[6] *J.A.M.A.*, 1954, 155: 1316 (August 7).

Abstracts from Medical Literature.

OTO-RHINO-LARYNGOLOGY.

Severe Epistaxis.

G. H. WOODRUFF (*Arch. Otolaryng.*, April, 1958) has previously described a type of nasal hæmorrhage which seems to be a distinct clinical entity and which he suspects to be associated with arteriosclerosis and hypertension, although there seem to be some other unknown factors in many cases. A small group of vessels lying at the junction of the nasopharynx with the posterior choana on the lateral wall just beneath the inferior turbinate was described. This plexus may be the site of bleeding in cardio-vascular epistaxis and it may be possible to control it with "spot" packing when the site is suspected. There have been three main methods of control in the past, cauterization, packing, and vascular ligation. A post-nasal plug of conical shape which can be drawn into the choana has been found useful. To keep the plug in place, a section of rubber tubing of large diameter placed across the nostril serves as an anchor for the holding tapes. This will maintain a certain amount of pressure without damaging the alæ. Suitable packing may remain undisturbed for a week or more. A mixture of conjugated œstrogens ("Premarin") may be administered intravenously up to every two hours. This substance has seemed to be of definite value in some cases, and supports a suggestion that hæmorrhages are associated with endocrine imbalances, usually a lowering of œstrogen content of the blood. Another substance which has been helpful is carbazochrome ("Andrenosem"), a derivative of epinephrin, given either intramuscularly or by mouth, as often as every hour for 24 hours, and then less frequently. Vitamin *K* seems helpful only when there is a prolonged prothrombin time. It may be necessary to ligate either the anterior ethmoid or sphenopalatine artery, using an orbito-ethmoid approach, or the external carotid may be tied in the neck. The author states that there is need for further improvement in the management of these cases and that the whole subject needs to be reexamined, beginning with basic factors such as vascular anatomy, especially in regard to anastomoses in the various areas of the nose.

Malignant Granuloma of the Nose.

M. M. SINGH *et alii* (*Lancet*, February 22, 1958) describe four cases of malignant granuloma of the nose, all of which ended fatally, and discuss the natural history of the condition. The condition is usually seen in a young adult, or in early middle age; it starts as a localized granulomatous lesion of the nose, paranasal sinuses, middle ear or nasopharynx and progressively destroys the nose, face and pharynx with little apparent resistance. It is a rare disease. In a recent review of the condition it was possible to collect reports of 39 cases in which a necropsy had been performed. Several authors have recorded a generalized vasculitis associated with this condition, and some have suggested that it may be a form of polyarteritis nodosa. The authors of the present paper state that all their four patients showed progressive destructive lesions in the nose and paranasal sinuses, without demonstrable bacterial or neoplastic cause. All had intermittent fever, and systemic involvement was suggested clinically by hepatomegaly, splenomegaly, lymphadenopathy, subcutaneous nodules or retinitis. All had albuminuria at some stage. In two, death was apparently due to renal failure, in one from hæmorrhage, and in one from toxæmia. Necropsy was performed in three cases, but in only one was there evidence of generalized vascular disease. The authors state that they have been impressed by the consistent course of the illness, which has three stages: (i) a minor rhinological lesion with a sero-sanguinous discharge, (ii) the development of a local destructive granuloma, (iii) the late appearance of systemic lesions. Advanced cases may conform to Wegner's granulomatosis, the essential features of which are: a necrotizing granuloma of the respiratory tract, generalized vasculitis and glomerulonephritis. The ætiology of the condition is unknown, but the authors agree with the suggestion that it is probably a hypersensitivity of some sort. They suggest that in future cases the treatment should be full doses of steroids from the beginning, perhaps combined with local radiotherapy, and that antibiotics should be avoided.

OPHTHALMOLOGY.

The Early Detection of Glaucoma.

H. REED *et alii* (*Canad. M.A.J.*, January, 1958) record the results of taking ocular tension of 2000 patients over 40 years of age. Most glaucoma surveys indicate that 2% of people over this age have glaucoma. If raised intraocular pressure is found, they state that the diagnosis should be confirmed by gonioscopy, repeated tonometry, the water drinking test, the mydriatic test, and tonography. In the authors' survey they examined the angle if the tension was raised; if the angle was wide they performed a water drinking test, and if narrow a mydriatic test. These two provocative tests are of great value in doubtful cases. A negative result does not necessarily exclude the disease. In their series of 2000 routine ophthalmic examinations 2·9% of the patients had glaucoma.

Vasomotor Factor in Glaucoma.

E. G. MACKIE (*Brit. J. Ophth.*, January, 1958) reviews the vascular causes of glaucoma and sums up the concept that either the disease is associated with an excess output of adrenergic materials or the presence of some factor causes excess sensitivity of the vasomotor system to normal adrenergic stimulation. He makes the point that the patient must be regarded as a whole and not as two eyes to be treated by miotics or surgery. There is a high ratio of stress among glaucoma patients. The author lays down a regime which relieves the stress and diminishes conditions which set up "provocative tests". He states that vasodilators *plus* high dosage of vitamin *A*, in addition to the other measures, may help the disease to be controlled without recourse to surgery.

The Treatment of Chronic Glaucoma.

D. A. CAMPBELL *et alii* (*Brit. J. Ophth.*, December, 1957) investigated the combined action of potassium bicarbonate and "Diamox" in the treatment of chronic glaucoma. They found that the addition of potassium bicarbonate in doses of 15 grains three times daily proved successful in combination with one daily dose of 250 milligrammes of "Diamox". Side effects were prevented and the intraocular pressure was controlled. The authors state that therapy with "Diamox" must be confined to individuals in whom there is no abnormality of renal function.

"Cardrase" in Glaucoma.

A. POSNER (*Am. J. Ophth.*, February, 1958) reports on the use of "Cardrase", a new carbonic anhydrase inhibitor in the treatment of glaucoma. He found that the drug was effective in lowering ocular tension in oral doses of 62·5 to 125 milligrammes four times daily. The drug proved to be twice as potent and equally well tolerated as "Diamox".

Retinal Detachment.

J. PICO (*Am. J. Ophth.*, February, 1958) reviews the various surgical techniques employed in the treatment of retinal detachment. He mentions the use of full thickness scleral resection. He describes the technique of lamellar scleral resection most widely used. Schepen's scleral buckling technique is mentioned, as is the scleral outfolding operation of Castroviejo. Finally, the use of vitreous implant as used by Shafer is described. The author gives the indications for scleral shortening as follows: inability of the retina to settle back after bed rest, aphakia, high myopia, multiple retinal breaks, large peripheral breaks or disinsertions, detachments following penetrating wounds, and when previous diathermy has failed. The author favours at least 14 days' bed rest after operation.

Intravitreal Vitreous in Retinal Detachment Surgery.

P. MCG. MOFFATT (*Tr. Ophth. Soc. U. Kingdom*, 1957) gives a general outline of the technique of transplanting vitreous. The donor vitreous is obtained from eyes received at the eye bank. The vitreous is aspirated six to 48 hours after enucleation through an 18 gauge needle. About two millilitres of clear fluid can be withdrawn. This is transferred to a sterile vial having a rubber cap and stored at 4° C. It remains suitable for use for up to three months. Forty-eight hours before operation a sample of vitreous is cultured. The recipient eye is treated by non-perforating intrascleral diathermy, and drainage is through a small scratch incision down to the choroid, which is opened by diathermy. The donor vitreous is introduced through a small radial incision four millimetres long and centred nine millimetres back from the limbus

either in the upper or lower quadrant on the temporal side of the sclera. Two mattress sutures are placed edge to edge through the lips of the incision. The needle is directed towards the centre of the globe and vitreous slowly injected until the intraocular pressure is raised to 40 millimetres of mercury, at which it is held for two minutes and then lowered to 30 millimetres of mercury. The sutures are tightened as the needle is withdrawn.

C. D. SHAPLAND (*Tr. Ophth. Soc. U. Kingdom*, 1957) describes his technique for collecting and injecting vitreous in retinal detachment surgery. All cases in which this procedure was used were desperate cases. Twelve cases were operated upon and the procedure appears to have played an important part in the successful reposition in two and in the improvement of four. Two of the latter were made worse by a second intravitreal vitreous injection.

The Surgery of Congenital Cataract.

A. B. NUTT (*Tr. Ophth. Soc. U. Kingdom*, 1957) discusses the surgical treatment of congenital cataract. He believes that bilateral complete cataract present at birth or soon after indicates that the other delicate ocular structures are probably damaged, and therefore there is nothing to be gained by operating before the sixth month. The author varies his operative technique according to the type of cataract present. In lamellar cataract the decision to operate in the three-year or four-year-old child is difficult; in older children operation is advised if vision is less than 6/24 and J8. He recommends discission alone or followed by linear extraction. The rubella cataract requires preliminary iridectomy followed by discission and then linear extraction. The disk-shaped cataract is dealt with by detaching the central plaque with a discission needle and then removing it later through a keratome incision. The peripheral portions of the lens should be treated by discission. For anterior polar cataract the author recommends discission if the pupil dilates, or preliminary iridectomy followed by discission and linear extraction.

N. S. JAFFE AND D. LIGHT (*Arch. Ophth.*, March, 1958) make a plea for linear extraction and outline their technique. The disadvantages of the simple discission operation are multiplicity of operations, frequent failure to obtain an adequate pupillary opening, disturbance of vitreous and glaucoma. All these risks are diminished with linear extraction. Most authors agree that if the vision in one eye is good or the opacification of the lens is only slight and there is dense opacification of the lens in the other eye, then surgery should not be performed. There is disagreement as to the age at which surgery should be performed; the authors operate on the first eye at six months. The pupil is dilated, using a solution of homatropine followed by 10% "Neosynephrin". After the child is anæsthetized a retrobulbar injection of xylocaine and hyaluronidase is given and digital pressure over the lids is exerted for four minutes. The conjunctiva at the upper limbus is dissected from the cornea and allowed to retract so that eight millimetres of limbus are bared. Two grooves are made at 11 o'clock and one o'clock and a six nought chromic gut suture passed through each groove. A keratome incision is made at the limbus between the grooves and is enlarged in both directions. A small peripheral iridotomy is performed at 12 o'clock or a complete iridectomy if the pupil is not fully dilated; two additional sutures are placed between the two previously placed sutures. Capsulotomy is then performed and the soft lens cortex and nucleus are milked from the wound. Irrigation is then performed. The iris is reposited, sutures tied, and air injected into the anterior chamber using a 27 gauge needle with blunted point. An antibiotic solution is instilled and both eyes are covered. Atropine is instilled at the first dressing. The authors report on 10 patients operated upon using this technique.

The Surgery of Congenital Ptosis.

B. W. RYCROFT (*Tr. Ophth. Soc. U. Kingdom*, 1957) discusses the methods used at the plastic unit at East Grinstead to correct congenital ptosis. He classifies cases as those with levator action, without levator action and bilateral infantile ptosis. If there is good levator lift a modification of the Bowman operation is used with a supratarsal line of sutures as recommended by Blascovicz. If there is no levator lift he uses a fascia lata autograft to raise the lid. For bilateral congenital ptosis it is essential to correct the ptosis early to prevent amblyopia and abnormal posture of the head and spine. A procedure which he recommends is the Friedenwald-Guyton suture as a temporary measure, with the intention of performing a permanent procedure at about three years of age.

Spiral Visual Fields.

T. F. SCHLAEGEL (*Arch. Ophth.*, January, 1958) surveyed the visual fields in 800 unselected eye patients and found spiral fields in 2·25%. The author is of the opinion that spiral and tubular fields are related and that in fact it is possible that spiral fields are tubular fields in the process of development. It was found that anxiety is frequently observed in patients with spiral fields and that with reassurance the spiral fields will occasionally disappear.

Tenon's Capsule in Strabismus Surgery.

F. H. ADLER (*Am. J. Ophth.*, April, 1958) describes three patients in whom strips of Tenon's capsule were used to align the eyes when the ocular muscle could not be found. In one case the inferior rectus had been severed and the other two were to correct exotropia after tenotomy of the medial rectus. The procedure is recommended in all cases of defective motility either due to previous surgical destruction of a muscle or in which the muscle is congenitally absent.

Operating Room Gonioscopy in Angle Closure Glaucoma Surgery.

R. N. SHAFFER (*Arch. Ophth.*, April, 1958) presents a technique for determining the presence or absence of peripheral anterior synechiæ. When tension can be restored to normal by medical means within 12 hours in angle closure glaucoma, conventional presurgical diagnostic methods can be employed. If tension does not revert to normal within 12 hours, surgery is undertaken. A bevelled corneal paracentesis is made in the lower third of the cornea to allow reformation of the anterior chamber. A routine *ab externo* peripheral iridectomy is performed. After the iris is reposited with a stream of saline the first half of a surgeon's knot is tied in the McLean suture. A sterile Koeppe contact lens is placed over the eye and filled with saline and the surgeon examines the eye gonioscopically. If the iris has dropped free of the trabecula the McLean suture is tied and the conjunctiva closed. If extensive anterior synechiæ are present, then a synechialysis can be performed through the original incision, or a second incision can be made behind the spur and a routine reverse cyclodialysis performed. Post-operatively the pupil should be dilated once daily for one week with "Neosynephrin" 10%.

Steroid Prophylaxis in Sympathetic Ophthalmia.

J. M. MCLEAN (*Am. J. Ophth.*, April, 1958) describes a case of sympathetic ophthalmia after a perforating injury in a boy aged eight years For some time after the injury steroids were given, and some days after withdrawal sympathetic ophthalmia appeared. Vigorous treatment brought about a cure. In this case at least, adequate steroid therapy failed to prevent sympathetic ophthalmia and it is suggested that the use of steroids after perforating injury is contraindicated. Its use may suppress without conquering the disease and so delay recognition and adequate treatment of the disease.

Keratoplasty for Herpetic Keratitis.

H. L. ORMSBY (*Am. J. Ophth.*, April, 1958) describes his technique of lamellar keratoplasty in herpetic keratitis. He uses a 10-millimetre graft of 0·6 millimetre thickness. Penetrating grafting has been used in several cases as a secondary procedure. The author has treated 25 eyes in this manner. In the post-operative care corticosteroids were used. This therapy has reduced post-operative reaction and has not resulted in an exacerbation of infection.

M. J. HOGAN (*Am. J. Ophth.*, April, 1958) considers that therapeutic lamellar grafting is indicated in cases of herpetic keratitis with chronic superficial or deep ulcerations which fail to heal after two or three months of treatment, to prevent recurrence of dendritic ulceration, and in chronic disciform ulcers which have perforated. Keratoplasty is contraindicated in cases which have secondary infection by bacteria or fungi. In the presence of glaucoma, every effort should be made to control pressure, but where pressure is uncontrolled removal of the necrotic tissue often results in subsidence of the glaucoma. Similarly, a resistant iridocyclitis may subside after keratoplasty.

The Wider View.

HEALTH PROBLEMS IN INDONESIAN VILLAGES.

WITH less than 1500 doctors to a population of over eighty millions, Indonesia's doctor-patient ratio is one of the lowest in the world. Most of these doctors are concentrated in the cities, where health services approach European standards—at least for those who can afford private treatment. In the rural areas, where 80% of the population live, mostly at long distances from the nearest clinic, there is only the crudest framework of a health service, and even the existing meagre facilities are chiefly for the benefit of the provincial town-dwellers. It is a commonly held myth that villagers live in healthy "wide-open" spaces free from the common scourges of city slum dwellers. The real situation is that the village people fight for a living off their small plot of land in conditions which are often no less crowded than the city dwellers, but more remote from emergency or routine medical aid. Their state of ill health and malnutrition is merely unseen and unheard by a city-centred bureaucracy and health service.

Most of the rural hospitals, in small or large towns, are staffed by one or two foreign doctors with the help of several Indonesian *"mantris"*—medical assistants trained in routine nursing procedures and in diagnostic and laboratory work. In each region there are several "policlinics", where a *mantri* is stationed. There may be as many as 60,000 persons in the *mantri's* area in Java, but on the outer islands the population is sparsely but widely scattered.

The *mantri* is virtually the "doctor" for his own area. He provides routine treatment for simpler illnesses and emergency aid, but must send seriously ill patients to the district hospital—if they are willing. Country doctors come and go, but visits to the remote policlinics are never frequent, and the stable element in the health service is usually the *mantri*. Those with long years of experience are mostly well versed in the common disorders, and are highly esteemed in their own area.

The hospital has an out-patient clinic, where usually a *mantri* treats the simpler problems and refers the difficult ones to the doctor—together with those who consider they have special claim to the doctor's personal attention, such as government employees. The latter often comprise an inordinately large proportion of daily attenders. Laboratory facilities are available for diagnosis of the commoner conditions, and medicines of routine nature—vitamins, iron, sulphonamides, penicillin and perhaps some antituberculosis drugs—are usually available in at least small amounts, but periodically supplies or money to buy them run out. Proprietary medicines and newer antibiotics are practically not available from the hospital. However, most government doctors in the afternoon hours have a private practice and may have such medicines or may write prescriptions for the nearest private dispensary.

Only a minority of people from outlying villages attend the hospital for treatment when ill, even when seriously ill. For many there are long distances to walk or perhaps expensive public transport is necessary, and remote villagers rarely have more than a few rupiahs in reserve. Even the local policlinics may be too far away (up to ten miles). Whether the relief obtainable from aspirin or eyedrops will be sufficient to be worth the effort, or whether it will be any better than what the *"dukum"* in his own village can offer, has to be calculated. Usually the *dukum* is tried first because he is cheaper and on the spot. His remedies are usually some form of potion over which incantations have been uttered, and the latter appear more significant than any medical properties supposed to be present. For the village people the primary concerns are food, clothing, shelter and security from bandits (in some areas) rather than health. For instance, at harvest time the farmers suffering from relapse of malaria will continue working until the task is completed before attending the clinic for treatment; at certain seasons the clinics are regularly empty for several successive weeks. This is in fact not so unreasonable as it seems at first sight, because in subsistence farming the proper care of the crops takes priority over everything else, and the people know, anyway, that the treatment from the clinic only hastens the usual course of recovery by a little bit.

So for practical purposes the villager neither seeks nor gets medical aid of any sort. The maladies which affect large proportions of village population are various skin and eye diseases, infestation with intestinal worms and dysenteries. In some areas malaria and frambœsia are still widespread. A low general level of nutrition is the rule: the supposition that because he lives close to the land the farmer's diet is usually a more balanced one is far from true. Much or all of the most valuable produce is sold in the markets for clothing or trifles of no intrinsic value. It is a commonplace that colds are followed by chronically discharging ears; that measles has a high mortality, often wiping out whole families; and that immediate relief of acute pain is never possible. Tuberculosis, with an incidence of perhaps 1%, and typhoid fever are relatively common by European standards, but affect only a minority of the whole population; leprosy is similarly a minority problem in many areas. Generally there is no hope of isolation for village dwellers with acute or chronic infectious diseases; the local hospital rarely has places for such patients.

Malaria and frambœsia (yaws) are being effectively combated by centrally planned campaigns. Indonesian personnel are trained specifically for these campaigns, which are conducted with assistance from WHO and UNICEF. DDT and dieldrin are used for spraying in malaria-infested areas; penicillin is used for mass treatment of yaws. Both these campaigns have yielded magnificent results. In areas where even a majority of the population have been affected by these afflictions, the incidence has been greatly reduced, and considerable manpower has been thereby made available for agricultural activity.

Worm infestations, dysenteries and eye and skin infections are almost inevitable and universal while sanitary and hygienic conditions are so unfavourable. Usually river water is used for drinking, cooking, washing and latrine purposes. Sometimes well water is available, but in the fertile coastal flats along Java's north coast, for instance, well water is too salty for drinking or washing. River water is always contaminated from villages upstream with worm eggs, amœbæ, bacteria causing dysentery and typhoid and skin and eye infections. The average farmer spends much of his working time in muddy rice fields where hookworms abound, able to penetrate his skin and migrate to the intestines, where they may contribute to severe anæmia if the diet is poor.

The nutritional level of Indonesian villages is rather variable. Perhaps a third of the population is predominately rice-eating; another half subsists on diets composed chiefly of tubers such as cassava; in eastern Java and the other eastern islands maize is the staple cereal. The rice-eaters are relatively better off, but the average protein intake of approximately one gramme per kilogram of body weight is minimal, and is quite inadequate for growing children, especially those of pre-school age. Supplements of vegetables and especially of animal products (meat, fish, eggs) are very small and expensive; in poor areas they are included only once weekly in the diet. Milk is practically never available in rural villages. Cassava contains no protein, and there is therefore a much higher incidence of malnutrition in these areas, and also in areas where rice or maize crops sometimes fail completely. But all over Indonesia the toddlers are liable to develop the serious protein-deficiency disease known as "kwashiorkor". In this condition growth lags behind the normal rate because of an inadequacy of protein in the diet after weaning; the children fail to thrive and gradually waste away, sometimes developing œdema, dermatosis, etc. This can be prevented by the inclusion of sufficient beans or bean products (especially *"tempe"*) in the diet, beginning after the age of six months. Better still are animal protein supplements, notably milk, such as are distributed through the maternal and child health centres. Unfortunately there is a widespread (false) belief that children are infested with worms through eating fish, which is therefore rarely given to children under the age of two or three years, and it is precisely these children who need it most. Even advanced cases of kwashiorkor can be cured by feeding the patients large amounts of concentrated skim milk mixtures. Vitamin *A* deficiency is also widespread amongst Indonesian children. The most readily available sources of vitamin *A* are spinach and *"kangkung"*, carrots, tomatoes, *ubi* (red sweet potatoes), papaw, mangoes, etc., but eggs provide the vitamin in a more absorbable form.

The nutrition problem is partly a matter of education in food values, and partly a problem of agriculture and economics. The small plots of land in Java will support only small families, and larger families are generally more poorly nourished. Many of the cassava areas are so unfertile that nutritionally better cereal crop yields are so low that the population must resort to cassava to satisfy hunger and caloric requirements. However, cassava is in the long run disastrous, nutritionally because of its low protein content, and also agriculturally because it depletes the soil (leaving it ultimately totally barren) and promotes soil erosion.

Many traditional beliefs adversely affect the diets, especially of children. In some places vegetables are held

to be inferior or unnecessary. There is widespread prejudice against milk. Meat as well as fish is often considered unsuitable for children. Children suffering from malnutrition are considered to be not "ill" at all—just "weak"; hence they are not brought for treatment, and one almost gets the impression that death is so common amongst children under the age of five years that it is accepted as "regular".

Contamination of water supply and non-use of soap promotes much skin infection—ordinary infected sores, infected scabies and fungous infections. Conjunctivitis and trachoma affect the eyes of up to 50% of the villagers, causing ultimately serious defects and even blindness in severe instances. Fortunately, however, in the majority of villagers the disease may run a milder course to spontaneous cure, and most are left only with scars not causing any symptoms.

How is the local *mantri* equipped to deal with this variety of health problems? Even with the best will in the world the problems are hopeless—by European standards. Patients are rarely able to come back each day, if required, for eye drops, dressings or injections. The amounts of medicaments available are usually quite insufficient to distribute for home use. Instructions for taking medicines are often not understood or carried out. Nutritional advice is all too often impossible for the patient to follow, because of the expense of all forms of animal protein. Tuberculosis patients are usually too poor to buy all the necessary drugs for the long courses of treatment required, and home conditions do not allow adequate isolation to prevent spread to children and other contacts in the home. Many of the patients who come to the clinic decline to report to the hospital if referred there when serious trouble is suspected. The meagre supply of drugs, bandages, etc., given to the policlinic is usually exhausted by the middle of the month; one patient with amœbic infection and half a dozen with bronchitis may use up all the supplies of emetine and sulphonamide.

Nevertheless, much can be done by encouraging the use of good foods rather than useless ones such as sweets, cassava preparations, etc.; the boiling of all water before drinking it; and the practice of personal cleanliness to avoid spread of eye, skin and intestinal disease. Yet training in public health education has not usually been a part of the *mantri's* hospital experience, where familiarity with special clinical conditions rather than common public health problems was the rule. The medical students likewise as yet do not get much practical experience, if any, in problems of village health.

A notable field in which much progress has been achieved is the maternal and Child Health Centre work, for which UNICEF has provided assistance. Trained midwives or assistants carry on regular supervision of ante-natal clinics, and when the time comes deliver the babies—usually in the mothers' homes, but in hospital if there is any complication. Later the progress of the child is checked for the first twelve months. Few village people as yet attend these clinics, which are still mainly in urban communities; but untrained midwives (*dukuns*) from the villages are now being given practical training at these centres in the rudiments of aseptic procedures when assisting childbirth, and they are encouraged to send patients to the midwife or hospital at the earliest signs of any trouble arising. Thus many mothers are now brought to medical aid before it is too late. The perinatal child mortality rate especially is lowered by bringing medical attention early, and by avoiding contamination of the umbilical cord, which used to be a frequent cause of tetanus in newborn babies.

Naturally there are sometimes *mantris* whose assistance is not as beneficial as it might be. Some have been in their present posts for decades and have had no teaching in modern medicine. Others have submitted to the tremendous pressure of the demand for injections. In the pre-war years arsenical injections worked wonders for yaws patients, and nowadays the results with penicillin are even more dramatic. The injection has become the "trade mark" of the health service, and this has led to serious neglect of the tablets or local applications so essential for effective cure in most conditions. Sometimes the *mantri* fails to prescribe them; sometimes the patient fails to take them when supplied. Some *mantris* supplement their meagre incomes by including an injection only if some additional payment is made. The faith in injections makes nutrition propaganda extremely difficult at present, because villagers believe that all ills can be cured with an injection; and if an injection is not given, they suppose it is because the *mantri* or doctor does not want to help or because they must pay more. Commonly village people see little connexion between food and health, and suppose that so long as the stomach feels full, all will be well; and for the infants, breast feeding whenever they cry is enough.

The regional hospital and its doctor are often enough equally involved in this modern type of magic. The doctor is busy trying to find an injection suitable (at least to his way of thinking—water would often do just as well) for each illness or symptom. The necessity to make a strict diagnosis, which will often require laboratory examinations, gradually loses its grip when it is only a matter of selecting an ampoule. The hospital becomes a fashionable injection counter with its own clientele. Of these 50% may be *pegawais*, though they may number only 1% of the total population. The villagers feel out of place in this clique, and so the status quo is happily preserved; customers are plentiful and usually satisfied, and the health inspector can report a successfully run country hospital because no one is articulate from the outer circles.

Village health is in the main a field untouched by modern medicine with the exception of the mass campaigns and maternal and child health centre work already mentioned. At present the problems inherent in sheer numbers, distance and poverty cripple any broad planning. For instance, no attempt has yet been made to bring nutrition propaganda to the village level. This indeed requires detailed knowledge of food deficiencies and agricultural potentials in each particular area, of which too little is known to enable relevant propaganda to be formulated, as yet. Again, a tuberculosis campaign is being waged in the towns where an X-ray unit is available, but the incidence in villages, according to recent WHO survey work in India, is no less than in the towns. Rural health projects are now being constructed in several provinces, under the supervision of a new division of rural health in the Health Ministry. Existing facilities and personnel are too remote from most villages to be able to bring effective aid in each village, and yet there is neither the finance nor the trained personnel to provide each village with its own health unit. Therefore some compromise must be evolved to utilize village workers in other spheres—such as education and agriculture—as health workers after additional practical training for such tasks. In the foreseeable future it will not be the number of doctors available, but the level of education of the *mantris* which will determine the progress of public health measures and education in Indonesian villages.

Some may wonder why such a state of affairs is allowed to persist unheeded. The fact is that to the casual observer the Indonesian villager appears strong and healthy; and indeed he often is so—at least when compared with villagers in famine areas of India, for instance. Dramatic famine or pestilence is rare. Yet when the living and health conditions of the villagers are carefully probed, it is apparent that there is a great gulf between the realities and what may be regarded as the minimum condition the nation itself will accept for its own people.

Wonosari,
Gunung Kidul,
Jogjakarta,
Indonesia.

K. V. BAILEY.

British Medical Association.

VICTORIAN BRANCH: SECTION OF MEDICAL HISTORY.

AT a meeting of the Section of Medical History of the British Medical Association (Victorian Branch) on October 7, 1957, Dr. W. W. S. Johnston exhibited a bound Address presented to the late Dr. Aubrey Bowen by the members of the Medical Society of Victoria in January, 1893. This Address was found amongst the effects of the late Mr. Studley Miller after his death in 1956, and by courtesy of his relatives was handed over for preservation in the museum of the Medical Society of Victoria.

In the course of his remarks, Dr. Johnston gave some particulars of the important work carried out for the Society and the medical profession by Dr. Bowen, and concluded by giving some account of the Miller family, of which Mrs. Bowen had been a member. The Address, inscribed on parchment and finely bound in dull red leather, runs as follows:

MEDICAL SOCIETY OF VICTORIA.

To Thomas Aubrey Bowen, Esquire, M.R.C.S., Eng., etc.

Dear Sir,

On behalf of the Medical Society of Victoria we tender to you the warmest thanks of the members for your invaluable services to the Society.

After joining the Society in 1864, you were elected Honorary Secretary in 1869, and ably fulfilled the duties of that office during four years. In 1874 you became Vice-President, and in 1875 worthily discharged the functions of the Presidency. In 1877 you were mainly instrumental in securing from the Crown a Grant of a site for a hall and library for the Society and in obtaining funds and preparing plans for the erection of the present buildings.

From the outset you have served the Society as Trustee under the Crown Grant. In 1884 you accepted the position of Honorary Treasurer, and zealously laboured in that capacity for over 5 years.

To our infinite regret you now feel compelled by ill health to resign the office of Trustee. In accepting your resignation the Society desires to place on record its great gratitude for so many eminent services rendered during so many years; and to express the fervent hope that the prolonged tour which is before you will bring you now strength and fit you for many years of honourable work in your old sphere.

We are, Dear Sir,

Yours most faithfully,

H. B. ALLEN, M.D., President;
CHARLES S. RYAN, M.B., C.M.,
D. ASTLEY GRESSWELL, M.A., M.D., Oxon., Vice-Presidents;
W. MOORE, M.D., M.S., Melb., Secretary.

Melbourne,
12th January, 1893.

Before passing on to further details concerning the recipient of the Address, Dr. Johnston pointed out that the signatories were themselves all men of mark:

H. B. Allen, later Sir Harry Allen, was Professor of Pathology in the University of Melbourne, 1882-1924, Dean of the Faculty of Medicine, 1886-1924, honorary pathologist, Melbourne Hospital, 1876-1924, and was one of the chief builders of the Melbourne Medical School.

C. S. Ryan, later Sir Charles Ryan, honorary surgeon to the Melbourne Hospital, was often known as "Plevna" Ryan because of his association with the Turkish forces in the Russo-Turkish War of 1877-1878; he was A.D.M.S., First Division, first A.I.F., and later consulting surgeon, first A.I.F.

D. Astley Gresswell was Medical Inspector and Chairman of the Board of Public Health from 1890 to 1904; he was a noted administrator in this field.

William Moore was honorary surgeon to the Melbourne Hospital and one who left a permanent mark on the art and practice of surgery in the community.

It might well be said: "Mighty men, which were of old, men of renown."

The words of the Address gave an indication of the devotion shown by Dr. Bowen to the Medical Society of Victoria, but his preoccupation with so much administrative work by no means interfered with his activities in his particular sphere of medical science, namely, ophthalmology. He had quite early shown an interest in the "oculistic speciality", and his name was linked with that of Dr. Andrew Gray as a founder of the present Eye and Ear Hospital in 1866. He served on the staff as honorary surgeon for 22 years, and during that period he made many contributions to the *Australian Medical Journal*, these including such subjects as amaurosis, granular lids, and notes on ophthalmic practice in various English and Continental hospitals. So eager was he in promoting the cause of medicine, and so successful were his efforts, that his name was associated with many of the medical institutions in this city.

The Medical Society of Victoria owed much to him, as the Address set out in part, and this might well be illustrated by a quotation from the *Australian Medical Journal* of January 15, 1893, in which the Annual Report of the Committee of the Medical Society of Victoria contained the following reference:

> In 1877, Dr. Bowen devoted himself heart and soul to secure a proper habitation for the Society. Previously, it had led a Bedouin existence. A piece of land had been reserved by the Government in 1860, at the corner of Drummond and Victoria Streets, but in spite of warnings from the Department of Lands and Survey and special meetings of all kinds, nothing further had been done. In 1877 Dr. Bowen, assisted mainly by Dr. Jonasson, Mr. Girdlestone and Dr. Neild, obtained a Crown Grant of the present site. He then devised the plan of raising funds for the erection of the Hall, by the issue of interest-bearing Debentures. He consulted with architects, and carried the whole matter to a successful issue. In the Crown Grant, Dr. Bowen was named Trustee, in conjunction with Dr. Cutts and the late Dr. Martin. The first meeting held in the Hall was the Annual Meeting on January 9, 1878, when the retiring President, Dr. McMillan, whose death we have just deplored, referred to the enormous debt which the Society owed to Dr. Bowen. In January, 1884, Dr. Bowen was elected Honorary Treasurer and did not resign till his duties as Commissioner at the Paris Exhibition called him away in 1889. To our infinite regret Dr. Bowen's health is now not satisfactory, and as he is leaving the Colony for an extended tour, he has thought proper to tender his resignation of the office of Trustee, which he has so long honourably held.

His association with the Eye and Ear Hospital came as a result of his work with Dr. Andrew S. Gray in the treatment of patients suffering from conditions of the eye, nose and throat. In 1867, following an approach by them to the Victorian Government, a grant of land was made and the first portion of the hospital erected. The title of Victorian Eye and Ear Hospital was adopted in 1873 at Dr. Bowen's suggestion. Later, at a sale of Crown land adjoining the hospital in Morrison Place, two blocks of land were purchased by Dr. Bowen. One of these he sold to the institution at the upset price paid for it (thought to have been £500), and on his death the other block was purchased from the trustees also at the original price. On this land was built the Aubrey Bowen Wing in 1896.

Dr. Bowen's name was also formerly incorporated in the old Melbourne Hospital by means of the Bowen Theatre, after a gift of £2000 by Mrs. Bowen in memory of her husband. Unhappily the name was not carried on in the new Royal Melbourne Hospital, nor was it to be found any longer in the Queen Victoria Hospital, which took over the buildings of the old Melbourne Hospital in Lonsdale Street.

The Austin Hospital was yet another institution to bear his name. In 1896 Mrs. Bowen donated the sum of £750 as the nucleus of a fund for the erection of a block of buildings known as the Bowen Home. This seemed to have been used partly as a nurses' home and partly as an administrative block. The building was completed at a cost of £2957 17s. 4d. and formally opened by Lady Brassey, wife of the Governor of Victoria at that time (Lord Brassey), on March 25, 1897. This building was still known as the Bowen Block, and contained two wards now used for housing part of the spinal unit.

Dr. Bowen was also associated with the Children's Hospital. In 1873 he became honorary consulting oculist, possibly the first specialist to be appointed to the staff. By a coincidence there was also a Bowen ward at the Children's Hospital. The hospital was reopened on its present site in Carlton on September 27, 1876. The opening ceremony was performed by Lady Bowen, the wife of Sir George Bowen, Governor of Victoria at that time, and the ward was named after her.

His great interest in the medical care of the community was exemplified in the benefaction of £20,000 which was left in his will for distribution among charities of the Colony and was applied by his widow partly towards the erection of various hospital buildings as described above.

By marriage Dr. Bowen was linked with the Miller family, whose members have made important contributions to public and business life in Melbourne for a period of a century and more. In 1870 he married Jane, second daughter of the Honourable Henry Miller, M.L.C., and, to quote from the obituary in the *Australian Medical Journal* of September 15, 1893, "he became from that epoch in his career, independent of his profession regarded as a source of livelihood. The interest he really felt in his art, however, suffered no diminution, for he continued to work as steadily as if he had no such reason for regarding his professional resources as auxiliary only. Nor did he relax in his contributions to the literature of ophthalmology". Dr. Bowen occupied the house on the north side of Collins Street East, near Spring Street, now known as "No. 8". This had been built by Henry Miller in 1871, and given as a dowry to his daughter, Jane. In 1894 the house was purchased by the late Sir Henry Maudsley, who lived and practised there for many years. This distinguished medical succession was being continued by Sir Henry's son, Dr. H. F. Maudsley, who now practised there.

Unhappily, the "fervent hope" expressed in the Address, "that the prolonged tour which is before you will bring you new strength and fit you for many years of honourable work in your old sphere", was not fulfilled. An obituary notice in the *Australian Medical Journal* of September 15,

1893, stated that Dr. Bowen died in London on July 27, 1893, aged 50 years, and gave these further details:

> Suffering as he did, for many years, from spasmodic asthma, it was fortunate for him that his means enabled him to travel. He, therefore, not only visited the other Colonies on frequent occasions, but paid several prolonged visits to the Old Country, on one of such visits, namely, in 1889, acting as one of the Victorian Commissioners at the Paris International Exhibition. More recently he was appointed by the Government to attend as their representative at the Medical Congress in Rome, which was to have taken place during this present month; but, calling at Naples en route for England, he experienced an attack of influenza, which aggravated his already long-continued pulmonic lesion, so that, when he arrived in London, he was fast sinking and he died shortly afterwards.

The name of one who achieved so much should be kept in memory. It was fitting that members of the British Medical Association, as they entered the home of their profession in Melbourne, should see what manner of man he was as he gazed on them from the finely carved marble bust in the vestibule, and it was also fitting that this Address given him in honour by his own generation should, for future generations, be entrusted to the Medical Society of Victoria for which he laboured so diligently and fruitfully.

Dr. Johnston concluded by reviewing the history of the Miller family through several generations from the early days of colonization in Australia to the present time, stressing their prominence in many aspects of life of the community, including business, pastoral, legislative, professional, sporting and artistic.

The meeting concluded after Dr. Bryan Gandevia had shown a number of colour slides relating to subjects of medico-historical interest overseas.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

THE PARADISE OF QUACKS.

[From the *Australasian Medical Gazette*, May, 1893.]

WE must not however overlook the fact that there are a very considerable number of unqualified persons, many of whom have had no medical training whatsoever, who practise medicine for gain in these colonies.

In New South Wales alone which has been styled the "Paradise of Quacks" we have upwards of 200 of such persons or one to three in proportion to registered men in active practice. Melbourne and suburbs can boast of 14 so called "Chinese doctors" who reside within the boundaries of "Greater Melbourne". These irregular medical practitioners of all nationalities are found in every part of Australia, though nowhere in such astonishing numbers as in New South Wales. The advertisements of these people are inserted daily in newspapers, the conductors of which assume themselves to be the leaders of public thought in the colony, and are the means by which many suffering people are robbed of their hard-earned money in a vain pursuit of health from a source which is malevolently impotent for the purpose.

Correspondence.

CONCURRENT VARICELLA AND HERPES ZOSTER.

SIR: The concurrent appearance of varicella and herpes zoster lesions has been reported previously (Brain, 1955[1]; Knyvett, 1957[2]). I should like to report two further cases.

The first patient was a girl, aged nine years, who suffered a severe herpes zoster rash of T9 to L1 and three days later developed a mild vesiculated rash of varicella. The mother stated that the child had had a mild attack of varicella at 15 months of age.

The second patient was a 34-year-old woman who was five and a half months pregnant. When first seen this patient had a severe generalized varicella rash and a typical mild herpes zoster lesion of T10 to T12. The history of pain suggested that the herpes lesion had developed three days after the varicella, but this was not substantiated. This patient also gave a history of mild varicella infection during the pre-school years.

Yours, etc.,

1286 Pittwater Road,
Narrabeen,
New South Wales.
July 9, 1958.

NEVILLE RINGROSE.

SCHEDULE "J".

SIR: The recently published Schedule "J" falls short of what was expected from the preliminary reports received over the last few months and is worthy of critical examination, particularly by general practitioners. I cannot agree that the principle on which the schedule is based is a good thing. Insurance companies do not, to my knowledge, consult professional men as to a fair fee for a life insurance premium, nor do they offer discount rates for promised, though seldom realized, early settlement. Why should we? I agree that fees should be uniform as far as is practical, realizing the many and varied modifications that make the typical case extremely rare, but the determination should be made solely by the profession. The increases in consultation fees, to take an example of the new schedule, offer one shilling, and the fee represents a discount of about 20% on the ordinary charge. With so many patients covered by medical benefit organizations, it seems foolishly benevolent to persist with the schedule and its attendant clerical work.

The restricted fees for prolonged cases are not in the best interests of the injured worker or his medical attendant. There is no justification for such limitation which I feel is designed to protect the insurer from unnecessary over-care charges, but in fact relieves his just responsibility. I have a compensation case suffering from brucellosis and am required by the consultant physician to see him daily for streptomycin injection. Therefore, seven days a week he attends the surgery, and I am required to be present on Sundays and holidays to treat him, at my inconvenience, and without fee, as he has passed his third week and seven consultations are now only considered worth two pounds, *plus* a contentious 12s. 6d. for the Sunday injection. Under the Medical Benefits Fund he would be entitled to a rebate of nearly £5 per week of treatment. It was proposed in the draft schedule to revert to ordinary fees when the company delayed payment; this did not appear in the agreed schedule. No mention is made in the schedule of witnesses' expenses and mileage charges for court attendance. The miserly payments now proffered are long overdue for review. No provision exists for the most common compensation treatment, that of suturing, and the final determination of the amount the insurer will pay follows protracted correspondence. Surely a list of charges related to the number of sutures and the depth of the wound could have been formulated.

When one complains to an insurance company he is told that the great bulk of the profession enjoys very harmonious relationship with the company: I would have believed this (even though I was unable to understand it), except for the conversations of so many colleagues relating experiences not flattering to the insurers. Occurrences I thought peculiar to me are common experiences: The hernia patient being told at the insurance office that his disability will be recognized and treatment afforded if he allows their "highly capable hernia expert" to operate, but no liability if he persists in having the operation done privately. The case of the insurance clerk advising the patient that the surgeon chosen by the local doctor was incompetent and that the last similar operation by the surgeon had ended in the worker being crippled for life. Seeds of distrust in their own medical attendants are sown too often in these interviews.

The new schedule still allows a lower fee for visits to a public hospital, and in practice does not allow mileage, even though the other patients seen on that visit, if any, may be public ward patients exclusively. Thus, in New South Wales, the public ward bandwagon is enhanced by the insurers, and a general practitioner could receive a total fee of 13s. 6d.

[1] Brain, W. Russell (1955), "Diseases of the Nervous System", 5th Edition, Oxford University Press.

[2] M. J. AUSTRALIA, 1957, 2:91 (July 20).

for a twenty miles journey because he saw a public ward patient or two as well as the worker.

In conclusion, the idea of the schedule might have been useful once, but today it represents the perpetuation of discount fees, unnecessary clerical work and definite financial loss. Moreover, it permits far too much outside influence on the members of the profession. Surely it is enough to have the State and Commonwealth authorities nationalizing us in easy stages, without insurance companies dictating their terms for our service to injured workers, which Schedule "J" definitely indicates. What support will the profession, particularly general practitioners, give towards abandoning the schedule?

Yours, etc.,

Grose Vale Road, Kurrajong, New South Wales. JOHN J. BAIN.

June 21, 1958.

CANCER OF THE UTERUS.

SIR: In your editorial of May 24, 1958, the importance of cytology (the Papanicolaou smear) in the early detection of carcinoma of the cervix is rightly emphasized. It is not generally realized that carcinoma-in-situ and also many early invasive carcinomas are symptomless and appear clinically as innocent erosions or even normal cervices. Little reliance can therefore be placed on the traditional methods of diagnosis by history taking and speculum examination, however carefully these are done. While the value of cytology is indisputable and has resulted in the detection of many early cases, its deficiencies should not be forgotten. The Papanicolaou smear even in the very best of clinics fails to detect about 15% of early cervical carcinomas. In those with less experience the failure rate is much higher. Another disadvantage is that a positive smear gives no idea of the actual site of the lesion, so that these small cancers can be missed by even the most thorough cervical biopsy.

Any method therefore which can overcome these deficiencies must obviously be of value. Colposcopy, not mentioned in your editorial but advocated by Dr. R. Francis Matters,[1] is just such a method. It allows a painless stereoscopic magnification of the cervix and is used in practically every big clinic in Europe. I have been using colposcopy in the study of apparently innocent erosions at King George V Hospital, Sydney, for over two years and am convinced of its very great value. By this method combined with the almost routine use of Papanicolaou smears several completely unsuspected cases of carcinoma of the cervix have been unearthed. These include some in which the Papanicolaou smear was negative and the colposcopic findings positive, and other small cancers where the colposcope has been of great value in pin-pointing the optimum site for biopsy. Our results from King George V Hospital have merely confirmed the many reports from Europe which have proved that the best results are to be obtained by the complementary use of cytology and colposcopy. It must be stressed, however, that these methods do not replace cervical biopsy as the method for final diagnosis.

There is an urgent need for these new diagnostic methods to be made more readily available to the public, but before this is possible more cytologists and colposcopists must be trained. The cyto-analyser which you mention, if it proves efficient, will be a great time-saver in large-scale cytology screening, but will raise difficult problems. Similar problems will arise in the commendable Tasmanian scheme mentioned by Dr. Campbell Duncan[2] in which all practitioners will be encouraged to take smears and thus become their "own cancer detection units". What to do with patients with the not uncommon cytological report "suspicious" and the occurrence of false-positive and false-negative smears are some of the difficulties which will be encountered. On this matter the opinion of two experts, Professor McKelvey of Minneapolis and Dr. Anderson of Edinburgh,[3] is worth quoting. The latter, agreeing with the dictum of Professor McKelvey, writes: "This work of searching for the earlier cancer must be carried out by interested study groups, and it is dreadfully dangerous for the responsibility for individual suspect cases to be thrown about between distantly acquainted gynæcologists, cytologists and pathologists." I agree with Dr. Matters that the development of multiple investigation centres and clinics is the best way of attacking this problem. It is only by the extended use of cytology and colposcopy that there will be a great increase in the numbers of women with cancer of the cervix discovered at a stage when cure can almost be guaranteed.

Yours, etc.,

225 Macquarie Street, Sydney, MALCOLM COPPLESON.

July 4, 1958.

[1] M. J. AUSTRALIA, 1958, 1: 922 (June 28).

[2] M. J. AUSTRALIA, 1958, 1: 923 (June 28).

[3] A. F. Anderson (1956), "Report on Cytology to the Royal College of Obstetricians and Gynæcologists".

FLUORIDATION OF PUBLIC WATER SUPPLIES.

SIR: N. D. Martin has criticized our paper (M. J. AUSTRALIA, February 1, 1958) in two letters (M. J. AUSTRALIA, February 22 and June 14). However, despite the fact that the length of his criticisms considerably exceed that of our paper, he has not indicated even one error in the statements made in demonstrating that there are disturbing features in published reports of fluoridation trials.

In regard to the other matters which Martin mentioned, all we ask is that the interested reader should study our paper in conjunction with these letters, so that he can judge for himself whether Martin's interpretation of our statements, and his remarks, are reasonable and accurate. Associate Professor Martin pointed out the crux of the matter, and revealed his attitude, when, in his letter of June 14, he expressed the following opinion: "It is not conceivable that all those persons comprising the bodies who have examined the evidence in favour of fluoridation are so statistically naïve that they have given their opinion without due consideration of the facts." It is precisely this trusting attitude towards endorsements by official bodies—in some cases based on the opinions of a few anonymous investigators—which has delayed critical examination of the methods used in these trials, and of the results published. It is widely regarded as "not conceivable" that, before the first official bodies to support this measure announced their endorsement, they had not completed competent and thorough examinations of, at least, the published part of the data collected in these studies. Also, it has been assumed that associations and individuals that followed this lead, and, therefore, accepted the responsibility of publicly advocating fluoridation, have undertaken independent examinations of the data, and not merely repeated the opinions of others. It has also been taken for granted that both sides of the question were examined, and not only "the evidence in favour of fluoridation".

This uncritical attitude to these studies is rife. For instance, Martin, in his letter of June 14, said that "the American Dental Association and the United States Public Health Service gave their unqualified endorsement only in 1950 and 1951 respectively". He apparently does not regard it as odd that the former "unqualified endorsement" was given less than six years after the commencement of the first of these trials. This endorsement could not have been based on an examination of the permanent teeth of children that satisfied his criterion by having "consumed this water continuously during the period of tooth formation", for at that time very few, if any, of their permanent teeth had even erupted.

Yours, etc.,

193 Spring Street, Melbourne, PHILIP SUTTON, ARTHUR AMIES.

July 8, 1958.

MEDICAL ETHICS AND INSURANCE REPORTS.

SIR: I would like to comment on the letter by Dr. C. C. McKellar in THE MEDICAL JOURNAL OF AUSTRALIA, July 5, 1958, regarding "Medical Ethics and Insurance Reports". I want to point out some possible misunderstanding of which he is probably not fully aware and which his letter can cause.

There is no doubt about it, as Dr. McKellar stated, that it is desirable to keep up the principle of medical secrecy at all times. However, a patient "with a compensation claim" automatically consents to the history and the result of the examination, including diagnosis, being sent to the insurance company or to the lawyers. Without such a report no "legal case" can possibly be made. These patients are not referred for treatment and no "doctor-patient" relationship can possibly develop. They are seeking legal and not medical

help for their condition, and that constitutes the basis of the consultation. Surely Dr. McKellar must realize that the patient's complaints in cases of compensation are exposed subsequently in open court not only to examination in chief, but to cross-examination by the defending counsel. Each and every one of those complaints can be publicly discussed whilst he as "the plaintiff" or his medical adviser or expert medical witness gives evidence, and because of it no professional secrecy can be adhered to without possible contempt of court. The secrecy would preclude any legal proceedings. Last, but not least, patients make compensation claims, not only under the compensation law, but whenever possible also under common law in Supreme Court actions, often in the presence of daily Press representatives who report to the public the complaints, diagnoses, etc., and the amounts awarded.

As to the diagnosis of a malingerer, I feel that such a diagnosis is hardly ever a proper one except in extremely rare instances. A malingerer has also reasons to produce symptoms, not always on the conscious level, and so he becomes a hysteric rather than a frank malingerer (which unjustly could imply dishonesty). However, there are instances where the word "malingerer" best describes the problem. A case in point is a man whom I have seen recently who claimed compensation "for headaches and nervousness" after a head injury and who stated during examination in the presence of his doctor and subsequently in court that before the accident he never had a headache. The defence then produced a copy of his application to the Repatriation Department for a pension for headaches due to war service made a few years before the accident occurred. I do not know of any better description for this person than "a malingerer", unless Dr. McKellar prefers to use the word "liar" or even 'perjurer".

I do not think that the sending of copies of reports prepared for the insurance companies or for solicitors to the patients themselves would serve any purpose except to deepen their symptoms, genuine or "made to order", and produced for the purpose of litigation, consciously or subconsciously.

Yours, etc.,

143 Macquarie Street, Sydney,
July 9, 1958.

OSCAR R. SCHMALZBACH.

Obituary.

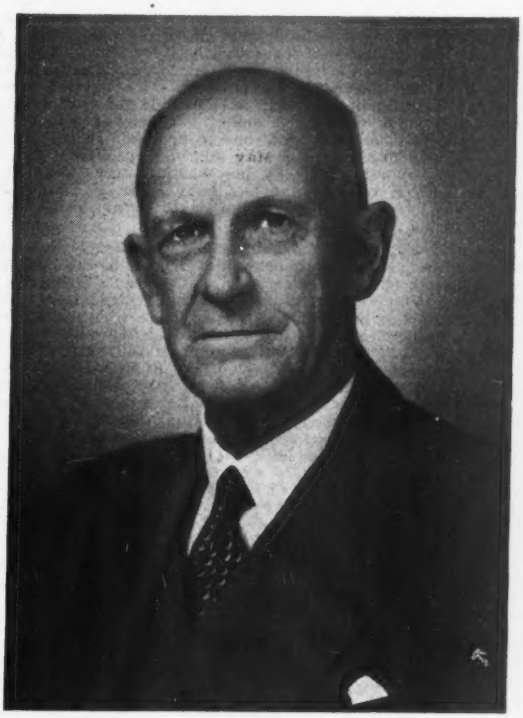
HENRY HUME TURNBULL.

WE are indebted to Dr. W. W. S. Johnston for the following account of the career of the late Dr. Henry Hume Turnbull.

With the death of Dr. Henry Hume Turnbull on February 11, 1958, there passed one who had followed in the tradition of such men as James Mackenzie, Henry Maudsley and Richard Stawell, who had exercised in his time great influence on medical education and clinical teaching, and who had served his country with distinction in two world wars. Despite his ability, he held a modest opinion of his own powers, and this, combined with a retiring and sensitive temperament, led to a less general recognition of his gifts than they merited. But to those who knew the man and his work, he was amongst the great physicians, and there would be a grievous gap in the medical history of this country if his achievements were not placed on record.

He was born at Lansdowne, Queensland, on October 28, 1882, the son of John and Matilda Jane Turnbull, the youngest of a family of five. His father had migrated to Australia from Scotland and later developed large pastoral interests in Queensland with which his son Hume was associated actively till the end of his life. His mother had been a Miss Wooley, one of a family of which Sir Leonard Wooley, the celebrated archæologist, had been a member. She was a woman remarkable for her strength of character and philanthropy and was for many years president of the Children's Hospital in Melbourne. These two contributed much to this country, and the family tradition was carried on nobly by their sons and daughter and again by the succeeding generation of whom three of the finest type of young Australian manhood gave their lives in the second World War. Hume was sent to Geelong Grammar School, where his record gave an indication of future achievements, with the post of prefect, a place in the school cricket team and first-class honours in English history on matriculation. He continued to distinguish himself after entering the medical course, gaining honours throughout and graduating in 1905 with first-class honours and the scholarship in medicine. A first class in surgery with a second place in the year, and a second class in obstetrics and diseases of women completed a remarkable course. He qualified M.D. in 1907.

After terms as resident medical officer, first at the Melbourne Hospital and then at the Children's Hospital, he decided to go to England for post-graduate work in diseases of the heart and was perhaps the first of a long line of Australian physicians to have the benefit of studying with an English cardiologist, in this case Sir James Mackenzie, at Mount Vernon Hospital, Hampstead. Turnbull strove to learn everything possible from the skill and wisdom of that great man, not only in the established methods of clinical observation, but also in the newer techniques employed by him, including the polygraph. Succeeding Australians owe



Turnbull a debt of gratitude, for it was because of the great regard in which he was held by Mackenzie that the path of those studying cardiology in London has been made easier, particularly at the London Hospital, in that succession of great teachers—Mackenzie, Parkinson and William Evans. On his return to Australia he was appointed medical clinical assistant at the Children's Hospital and later also at the Melbourne Hospital. His opinion was much sought after by those who were quick to recognize that he had brought back something of real value to the practice of medicine. But success for the young consultant in those days came slowly and there was no position on the full honorary medical staff available at either hospital at that time.

He was prepared for a long period of waiting, when suddenly his life, as that of so many others, was completely changed by the outbreak of war in August, 1914. He enlisted for service abroad and sailed in the *Kyarra* for Egypt as Captain, A.A.M.C., in December, 1914, on the staff of No. 1 Australian General Hospital. In the early days of the war adherence to military codes, often demanded with unreasonable strictness by those in authority, caused much heart burning and dissatisfaction among highly skilled professional men subjected to wearisome conditions during the long sea trip to the Middle East and the frustrating experiences of the settling-in-period in Egypt. And so it was probably with considerable relief that Turnbull found himself posted to Alexandria in charge of a convalescent depot at Ras-el-tin Here he handled, with great skill, the difficult assignment of dealing with patients from the Gallipoli campaign until the end of 1915, when he contracted dysentery and was invalided to England. After recovery he was posted back to No. 1

Australian General Hospital, which by this time had been established in France at Rouen. Then followed an exacting and important period of his military duties when his powers as a physician were taxed to the full in the control of sixty beds occupied by men with chest wounds, many of them from the terrific fighting around Pozières. Undoubtedly the experience thus gained stimulated his interest in diseases of the chest and laid the foundation of his skill in diagnosis and treatment in that field of medicine.

He was fortunate in having associated with him as sister-in-charge Miss Marjorie Yuille, who had trained at the Melbourne Hospital, had also sailed in the *Kyarra* on the nursing staff of No. 1 Australian General Hospital, and whom he was to marry in England early in 1917.

His ability and experience inevitably attracted attention, and in 1917 he was appointed Junior Medical Consultant to the A.I.F., being associated in this work with Colonel (later Sir Henry) Maudsley, the Senior Medical Consultant. He also carried out special examinations for the Australian Flying Corps with particular reference to cardiac problems. In view of his qualifications for such work he was posted back to Australia in the early part of 1918 for this purpose, but, owing to a change of policy whereby arrangements were made for such examinations to be made in the United Kingdom, the necessity for this lapsed. In after years he was prone to make little of his wartime work, but those familiar with it realize that few have given so much skill to the sick and wounded or indeed to army problems in general as he.

It was now that he showed his full stature as consulting physician and clinical teacher. As a member of the honorary medical staffs of the Melbourne and Children's Hospitals he had great scope for teaching which he utilized to the full. He had been appointed honorary physician to in-patients at the Children's Hospital while on war service in 1915, but resigned in 1923 as his transition from out-patient to in-patient physician at the Melbourne Hospital was then imminent. He remained on the active staff of the Melbourne Hospital till December, 1939, when he resigned. On both hospitals he was honorary consulting physician until the time of his death. He was associated in a similar capacity with the Women's Hospital, where problems concerning heart disease in pregnancy were his special concern. His interest in medicine covered a wide range and some of his most valuable work as a physician was achieved in the field of thyroid disease. In this his name is linked with those of Dunhill and Alan Newton in the clarification of diagnosis and ætiology and in the introduction of suitable methods of management. The paper entitled "Toxic Goitre", written in conjunction with Newton and published in the *Australian and New Zealand Journal of Surgery* in 1934, is a memorable witness to this. As a teacher he was at his best with senior and post-graduate students. His ability to throw light on obscure problems was strengthened by clarity of thought and forthright utterance. He was uncompromising in criticism of anything nebulous in clinical method or treatment, so that the average student was apt to be rather devastated by a seemingly destructive attitude, whereas the more experienced was delighted by his intellectual honesty. The admiration of his resident medical officers and the devotion of his patients bear witness to the value of his work at teaching hospitals.

In the years after the first World War he was lecturer in therapeutics in the University of Melbourne, in which capacity he served on the Faculty of Medicine from 1920 to 1925. For some time he was also a member of the Medical Advisory Committee set up to advise the Repatriation Commission in respect of claims made in relation to war service. This body was in effect a final court of appeal, and included Sir Henry Maudsley, Sir George Syme, Sir Richard Stawell and, at a late date, Dr. T. E. V. (later Sir Victor) Hurley, Dr. S. O. Cowen and Dr. B. T. Zwar. Unlike his close friend Sir Alan Newton, he neither wrote nor spoke frequently on medical topics, though when he did, it was with an air of authority and profound knowledge. One of the few formal addresses delivered by him was the Bancroft memorial lecture in Brisbane in June, 1941, entitled "Fear as a Factor in Disease". In this he dealt with the fears of the patient, so often doctor-induced, with special reference to cardiac symptoms, and criticized severely both the doctor and the quack—the former for often sowing the seed of fears, the latter for exploiting them. Characteristic of his outlook were his main contentions that medical men should make up their minds as to diagnosis and treatment on medical grounds and not on theoretical or sentimental considerations, that machines such as the manometer and the electrocardiograph must be used with proper perspective, and that doctors should strive to treat the man as well as his disease. It was a prime conviction of his—born of his experience of repatriation medical problems—that a war pension is a calamity and not in any way an asset to a good man, and that a vast number of pensions need never have been given if men had not felt that they were damaged and could not exert themselves safely. This was no expression of callous disregard but the objective view of a wise physician surveying a scene littered with countless neurotic wrecks. Medical politics made no appeal to him and he was impatient of the routine discussions inevitable in committee work. When problems which claimed his interest were debated his opinion was sound and his touch sure. He was a foundation member and member of the first Council of the Association of Physicians of Australasia in 1930, and on the formation of The Royal Australasian College of Physicians in 1938, became a foundation fellow of that body.

The advent of World War II in 1939 again completely disrupted his professional life. He had previously been selected by Major-General Rupert Downes, at that time Director-General of Medical Services, as an obvious choice for senior consultant status should war break out and he volunteered for service at the outset. He attacked the problems confronting him with characteristic thoroughness. To one of his temperament and far from robust health, the strain and discomfort of long air trips throughout Australia and New Guinea under wartime flying conditions were considerable, but he continued till the end with dour determination, and the value of his contribution to the Army can be measured by the account of his work given by Major-General Sir Samuel Burston. The burden of these years was immeasurably increased by the loss of his younger son Henry, a young man of great qualities who had enlisted in the R.A.A.F. after passing the first year of his medical course, and lost his life as an observer whilst taking part in a reconnaissance off the coast of Norway. He bore this with unflinching fortitude, but those nearest him felt that much of the zest for professional practice had gone with this tragic blow. He was still much sought after as a consultant, but he preferred gradually to withdraw. However, the Royal Melbourne Hospital still claimed his interest and he was prevailed on to accept the position of Dean of the Clinical School and gave valuable service in that capacity from 1946 till 1949. He was appointed honorary physician to the Duke of Gloucester and his family while His Royal Highness was Governor-General of Australia.

In later years his responsibilities in connexion with family affairs became greater, and it was his habit, one that gave him much enjoyment, to visit pastoral properties in Queensland twice each year. He was also closely associated with the Turnbull Trust established by himself, his brothers and sister in memory of their parents. This was supplemented after the second World War by another trust as a memorial to three of the younger generation who had lost their lives on service. The object of the trust is that prominent clergymen from places outside Australia shall from time to time temporarily occupy the pulpit of Scots Church, Melbourne. The conception showed great vision and the results have been far reaching for both the Presbyterian Church and the community. In its working Hume Turbull played an active part.

His less serious pursuits were varied. He was a follower of cricket and for many years played tennis regularly. He was a competent golfer and his name appears among competition winners at the Royal Melbourne Golf Club. He showed an interest in racing; his father had been a prominent owner and his brother Richard had been chairman of the Victoria Racing Club and had owned Sirius, winner of the Melbourne Cup in 1944. Always his garden and his flowers were a joy to him, his family and his home in abiding happiness.

The last period of his life was clouded by a long illness and much suffering which he endured with most valiant spirit. The scene at the funeral service was one supremely fitting and exquisite in its setting—a perfect summer's day, the sunlight dappling the lawns as it filtered through the foliage of lovely oak trees, the simple and touching address of the Reverend Sir Frank Rolland as he sketched the life of one modest and courageous, of high principle, of unswerving loyalty. And so a great man passed on—one who had earned the esteem and affection of friends and colleagues. From them deep sympathy goes to his widow, son and two daughters, and the hope that they will find comfort from the widespread tributes that have been paid to his memory.

MAJOR-GENERAL SIR SAMUEL BURSTON writes: For his distinguished services in World War I Hume Turnbull was mentioned in dispatches. He retired after the war, but in 1937 he was brought into the Reserve of Officers as a consultant with the rank of honorary lieutenant-colonel. In July, 1941, he was appointed consulting physician on the

D.G.M.S.'s staff at Army Headquarters in a part-time capacity. When I returned from service abroad and was appointed D.G.M.S., the only consultant physician on full-time duty on my staff was Colonel N. H. Fairley, who was completely occupied with the vital problems connected with the prevention and treatment of malaria and other tropical diseases. As mobilization was in full swing and the medical services were rapidly expanding, the appointment of a second consultant physician on full-time duty was essential. It was therefore decided to appoint Turnbull to this position. His principal duties were to advise the D.G.M.S. on all matters of medical policy referred to him, to recommend medical officers for appointment as physician specialists in the many general hospitals, casualty clearing stations, camp hospitals and other medical units, and, in conjunction with other consultants, to prepare technical instructions for issue by the D.G.M.S. to all medical units, laying down methods of diagnosis and treatment that would ensure that the highest standard of efficiency was maintained throughout the medical services. In order to keep himself informed he made frequent visits to the general hospitals and other hospital units scattered throughout Australia and in the operational areas. On these visits his high ethical standard and sense of duty, his profound knowledge of medicine and his wide experience and sound judgement as a physician, together with his capacity for frank but constructive criticism where needed, proved a great stimulus to the units he visited and a big factor in the maintenance of a very high standard of professional efficiency throughout the medical divisions of the hospitals of the Australian Army Medical Corps. Those qualities, together with his complete loyalty to and pride in the corps he served so well, made him an invaluable adviser in the councils of the Medical Directorate.

I shall always remember his loyal friendship and unfailing support throughout his service at Army Headquarters as one of the great privileges I enjoyed through those most exacting years. He was strongly recommended for appropriate recognition of his distinguished and valuable services, but unhappily, owing to the policy of the government then in power, the recommendation was not sent forward.

DR. EDWARD R. WHITE writes: Henry Hume Turnbull and the writer went to the same boarding school in their early youth, and so commenced a life-long friendship which increased with the passing years. Hume was always at or near the top of the class and played most usefully in all school teams, but cricket was his earliest love, and later on he became the keenest and most candid critic I ever knew.

During his first visit abroad as a young graduate he studied under that great cardiologist in London, the late Sir James Mackenzie, for whom Hume had the greatest admiration and affection, and these were, I believe, warmly reciprocated.

On the outbreak of World War I, Hume Turnbull at once volunteered and was posted into No. 1 Australian General Hospital, which was settling into the great Heliopolis Palace Hotel at Heliopolis, six miles from Cairo and on the desert edge. Soon after the landing at Gallipoli, large numbers of Australian sick and wounded were being returned to No. 1 Australian General Hospital. It was decided early to establish an A.I.F. convalescent hospital at Ras-el-tin, Alexandria, and Hume Turnbull became medical officer-in-charge. He invited me to visit him and have a week's holiday from the desert. This proved a most delightful rest and change. His staff was Matron Finley, a leading sister, formerly from the Melbourne Hospital, and the senior sister was Marjorie Yuille, a Melbourne hospital nurse, who came from a well-known Melbourne family. Hume Turnbull was the life and soul of this convalescent depot, for he displayed the greatest admiration and affection for "his simple Diggers" who had already proved to be the best and bravest fighting stuff in the world. This real affection was most warmly reciprocated by his grateful patients. Most reluctantly I moved on as my unit was ordered over to Anzac. On his return home at the end of the war he married sister Marjorie Yuille, which proved the happiest of unions.

Later in life, Hume, as a busy and distinguished heart specialist, became a first-class tennis player, and those of us who fortunately belonged to his week-end team will never forget the healthy exercise and pleasant comradeship on his tennis court, surrounded by a really beautiful garden. His final illness was long and difficult, which he gallantly faced up to with the greatest patience and bravery.

A friend and admirer of Dr. H. Hume Turnbull writes: The death of Hume Turnbull ends a very valuable life in the community. Other writers will have described his school and university career. Soon after completing his residential duties at the Melbourne and Children's Hospitals he developed a cardiac discomfort which caused some anxiety, and he was advised to attend the clinics of Sir James Mackenzie and Sir Thomas Lewis in London. Important new developments were taking place in the science of cardiology, and when Turnbull arrived in London he was able to participate in the new investigations and to learn what great changes had occurred and were still being perfected. He lived for months in these clinics and then returned to Melbourne, greatly enriched in knowledge and wisdom, and gave many post-graduate discussions and frequently demonstrated the value of the polygraph and electrocardiograph. He became one of the first cardiologists in Melbourne, and for years his opinion and services were sought after and appreciated.

Post-Graduate Work.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

Combined Pædiatric Post-Graduate Week.

THE Melbourne Medical Post-Graduate Committee has arranged a combined pædiatric post-graduate week, which will consist of a six-day programme of scientific and social events, from September 1 to 6, 1958. It combines the Royal Children's Hospital refresher course in pædiatrics with the annual Pfizer lectures of the Victoria Faculty of the Australian College of General Practitioners, and with the British Medical Association clinical meeting which will be held on the Wednesday evening. The pædiatric course will be held from September 1 to 5, the Pfizer lectures on September 6. Professor Lorimer Dods, who is Pfizer interstate lecturer for the Victoria Faculty of the College, will also be present to take part in the latter half of the pædiatric course.

A fee of £1 1s. is payable for the Royal Children's Hospital pædiatric course. It covers lunch and morning and afternoon teas. No fee is required for attendance at the Pfizer lectures on September 6.

So that the organizing committee can have an idea of the numbers intending to be present, it is requested that an enrolment form, obtainable from the Melbourne Medical Post-Graduate Committee, be completed and returned by August 7, or as soon as possible.

Pædiatric Course.

The pædiatric course will be held at the Royal Children's Hospital, Pelham Street, Carlton, from Monday to Friday, commencing each day at 9.15 a.m. and continuing till 4 or 5 p.m. The programme will be as follows:

Monday, September 1 (Department of Psychiatry): "The Nervous Child", Dr. W. Rickards; case discussion, "Teenage Troubles", Dr. V. Ashburner; "Hip Disorders in Childhood", Mr. J. B. Colquhoun; "Investigation of Failure to Thrive", Dr. J. Perry; "Common Skin Diseases in Childhood", Dr. R. Kelly; "Infective Diarrhœa", Dr. D. Danks; "Use and Misuse of Aspirin", Dr. B. Neal; "The Concept of Skeletal Age", Dr. A. Roche.

Tuesday, September 2: "Respiratory Problems of the Newborn", Dr. W. Kitchen; "Causes of Exacerbations of Respiratory Disease", Dr. J. Court; "Squint", Dr. R. Orr; "Intoeing", Dr. P. Williams; "Neonatal Jaundice", Dr. E. K. Turner; "Congenital Heart Disease" (introduction, Dr. M. L. Powell; examination, Dr. A. W. Venables; investigation, Dr. H. G. Hiller; demonstration of patients; discussion (including surgery)).

Wednesday, September 3: "Use and Misuse of Radiology", Dr. H. G. Hiller; "Respiratory Tract Disorders in Children", Dr. A. Medwyn Hutson; "Problems of Prematurity", Dr. T. Maddison; "Eneuresis and Encopresis", Dr. H. J. Sinn; "Agammaglobulinæmia", Dr. R. Townley; "Antibiotics: What's New", Dr. S. W. Williams; "Viral Diseases of Interest in Melbourne", Mr. I. Jack. 8 p.m.: B.M.A. clinical meeting, consisting of case demonstrations by the physicians and surgeons of the Royal Children's Hospital and by the research units and other members of the medical staff. A full programme of this evening will be published next month.

Thursday, September 4: "Common Minor Postural Defects", Mr. J. Critchley; "Congenital Lesions of the Spinal Cord", Mr. E. Durham Smith; "Joint Swellings in Children", Dr. D. Galbraith; "Turns", Dr. M. J. Robinson; "Minor Medical Maladies", Dr. M. Blanch; "Ductus Arteriosis in the Newborn Period", Dr. A. Venables; "Posture, Toys and Boots", Dr. Jean Macnamara; "The Manifestation and Recognition

of Malocclusion in Children", Dr. A. Parker; "The Ætiology of Congenital Defects", Dr. D. Pitt.

Friday, September 5: "Anæmia in Childhood", Dr. J. H. Colebatch; "Hand Injuries of the Complex Type", Mr. G. Gunter; "The Problems of Disfigurement in Childhood", Mr. A. R. Wakefield; "Chest Wall Deformities", Mr. N. A. Myers; "Genital Deformities", Mr. A. Murray Clarke; "Deformities of the Feet", Dr. D. Schlicht; "Undescended Testicles", Mr. Peter Jones; "Obesity: A Glandular Disorder?", Dr. H. N. B. Wettenhall.

Pfizer Lectures.

The Pfizer lectures of the Victoria Faculty of the College of General Practitioners will be held in the lecture theatre of the Royal College of Obstetricians and Gynæcologists, 8 Latrobe Street, on Saturday, September 6. The programme will be as follows: 10 a.m., "Preventive Pædiatrics", Professor Lorimer Dods; 11.20 a.m., "The Newborn Infant—Normal or Abnormal", Dr. Glyn White. 12.30 p.m., lunch at the Royal Children's Hospital. 2 p.m., "Pædiatrics With or Without Hormones", Professor Lorimer Dods; 3.30 p.m., "Ancillary and Social Services Available to the General Practitioners in Victoria", Dr. J. S. Collings.

Information.

Further details are obtainable on request from the Post-Graduate Committee or from the Dean of the Clinical School at the hospital.

Notes and News.

Pan-Pacific Rehabilitation Conference.

The following information relates to the Pan-Pacific Rehabilitation Conference to be held in Sydney from November 10 to 14, 1958.

Programme.

Monday, November 10: 9.30 a.m., general assembly, introduction of delegates, and opening address on the theme of the conference by the President of the International Society for the Welfare of Cripples. 11.15 a.m., plenary session, "The Way Back: An Exposition of the Philosophy of Rehabilitation". 2.15 p.m., plenary session, "Acceptance of the Disabled by the Community: (*a*) Attitude of the Fellow Worker and the Trades Union Movement, (*b*) Attitude of the Employer, (*c*) Insurance Aspects of the Disabled in Industry, (*d*) Disabled in Society". 5 p.m., official opening of the "Aids for the Disabled" exhibition.

Tuesday, November 11: 9.30 a.m., plenary session, "Childhood: (*a*) Hospitalization, (*b*) After-Care, (*c*) Home Care, (*d*) Education". 2.15 p.m., visits of observation to selected hospitals, special schools and centres.

Wednesday, November 12: 9.30 a.m., plenary session: "Rehabilitation of the Aged with Special Reference to Hemiplegics: (*a*) General Geriatric Problems, (*b*) Medical Rehabilitation, (*c*) Physiotherapy, (*d*) Occupational Therapy, (*e*) Nursing, (*f*) Social Work". 2.15 p.m., multiple (concurrent) sessions: "Education", "Fitting of Prostheses", "Rheumatism".

Thursday, November 13: 9.30 a.m., plenary session, "General Problems of the Amputee". 11.15 a.m., plenary session, "Paraplegia: (*a*) Neurosurgery and the Early Care of the Paraplegic, (*b*) Nursing and Special Aspects of Treatment, (*c*) Medical, (*d*) Absorption into Industry". 2.15 p.m., visits of observation or sectional meetings. Evening, meetings of professional associations.

Friday, November 14: 9.30 a.m., plenary session, "Employment of the Disabled: (*a*) Pre-Vocation Training, (*b*) Training for Employment, (*c*) Employment". 11.15 a.m., multiple (concurrent) sessions, free papers. 2.15 p.m., general assembly, review of conference, address, closing of conference.

Miscellaneous Information.

The language of the conference will be English, and no translation will be available.

Registration.—The registration form should be accompanied by a registration fee of five pounds (Australian), cheques being made payable to the Australian Advisory Council for the Physically Handicapped. If a registered person is unable to attend, he or she will be entitled to a refund of four pounds ten shillings (Australian), provided the organizers are notified before November 1. Provisional registrations (without payment or fee) will also be accepted now. They should, however, be confirmed and the registration fee paid as early as possible.

Accommodation.—Upon receipt of registration application, assistance will be given with accommodation if required. The form of application for accommodation should accompany the registration application, or be sent as soon after it as possible.

The Post-Graduate Foundation for Medical Education and Research in the University of Sydney.

The Vice-Chancellor of the University of Sydney, Professor S. H. Roberts, has announced the establishment of a Post-Graduate Foundation for Medical Education and Research within the University of Sydney.

The affairs of the Foundation will be conducted by a council, which, in addition to members elected annually by the governors and members of the Foundation, will include representatives of the University, the Faculty of Medicine and the Post-Graduate Committee.

Mr. Frank Packer has been invited by the Senate to be the first president of the Foundation and the following have been invited to be members of its first council: Mr. W. Farnsworth (chairman), Sir Garfield Barwick, Mr. Rodney Brown, Mr. S. R. I. Clark, Mr. J. G. Cooper, Mr. R. Crichton-Brown, Mr. Vincent Fairfax, Mr. H. P. Giblin, Mr. W. L. Murray Robson.

The University will be represented on the council by the Chancellor, Sir Charles Blackburn, the Deputy Chancellor, Major-General I. Dougherty, the Vice-Chancellor, Professor S. H. Roberts, and the chairman of the Professorial Board, Professor W. M. O'Neil. The Faculty of Medicine will be represented by the Dean of the Faculty, Professor Bruce Mayes, and the Post-Graduate Committee in Medicine by its chairman, Dr. V. M. Coppleson, and Dr. George Bell.

All donations and bequests to the Foundation will be donations to the University and free of income tax and gift duty. The address of the Foundation is: The Post-Graduate Foundation for Medical Education and Research, 131 Macquarie Street, Sydney.

The Gairdner Foundation Awards.

The Gairdner Foundation is a charitable organization, incorporated in December, 1957, under the laws of the Province of Ontario of the Dominion of Canada. Its objects are to encourage and reward individuals who have made major contributions to the conquest of disease and the relief of human suffering, with special emphasis on arthritic, rheumatic and cardio-vascular disease.

The Foundation has announced the establishment of international awards in two classes:

Gairdner Foundation Award of Merit.—A prize of $25,000 is to be awarded not more than once in every four years to the individual or group of individuals who, in the opinion of the Foundation, has made the most outstanding discovery or contribution in the fields of the arthritic, rheumatic and cardio-vascular diseases.

Gairdner Foundation Annual Awards.—A series of prizes of $5000 each are to be awarded in any one year to not more than five individuals who, in the opinion of the Foundation, have made outstanding discoveries or contributions in the same field.

The awards are prizes for achievement and are not grants for the support of future research. All awards will be made solely in the discretion of the Foundation and will not be open to application on the part of potential candidates. The purpose of these awards is to confer signal and substantial recognition upon those individuals whose recent work or discoveries constitute tangible achievement in the fields of the arthritic, rheumatic and cardio-vascular diseases. Winners will be free to make personal use of their prizes in any manner of their choice. Awards may be made to residents of any country without restriction as to nationality and will be payable in Canadian funds. The first awards will be made during 1958. Notwithstanding its immediate objectives in the fields of arthritic, rheumatic and cardio-vascular diseases, the Foundation may in its discretion reward those who, through discoveries of major importance in other fields of medicine, may contribute to the conquest of disease and the relief of human suffering.

Where winners accept an invitation from the Foundation to participate in scientific meetings in the city of Toronto, Ontario, Canada, or where winners accede to a suggestion from the Foundation that they visit professional colleagues at research or academic institutions in other countries and

as a result travelling expenses are incurred, the amount of the award may be increased appropriately.

The Foundation has arranged to secure the confidential advice of many prominent medical scientists throughout the world.

Royal Australasian College of Surgeons.

ADMISSION OF NEW FELLOWS.

AT a meeting of the Council of the Royal Australasian College of Surgeons, held on June 21, 1958, the following, having satisfied the Court of Examiners, were admitted to fellowship of the College: Allcock, E. A.; Brearley, K. S.; Bremner, J. C.; Brett, P. R.; Elrick, W. L.; Failes, F. G.; Farrar, D. A. T.; Foster, J. B.; Grant, P. J. F.; Grassby, G. C.; Gray, G. L.; Hinricksen, K. W.; Inglis, M. J.; Jones, R. F. C.; Jose, G. A.; Kaye, M.; Kent, M.; Lancken, J. H.; Lindsay, R. A.; MacLeish, D. G.; Mitchell, R. I.; McEwan, L. E.; O'Brien, H. D.; O'Neill, J. P.; Reddel, A. E. McK.; Russell, E. A. D.; Salvaris, M.; Simpson, D. A.; Sinclair, G. W. G.; Trinca, G. W.

FINAL FELLOWSHIP EXAMINATION.

THE next meeting of the Court of Examiners for the final examination for fellowship of the Royal Australasian College of Surgeons will be held in Melbourne beginning on Friday, October 17, 1958. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Censor-in-Chief for permission to do so before September 4, 1958. The appropriate forms are available from the Examination Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1.

Candidates who have already been approved by the Censor-in-Chief, but who have not yet presented for the examination, may present at this examination provided they notify the Secretary of their intention to do so by September 4, 1958. It is stressed that entries close on this date and that late entries cannot be accepted. The examination fee is £26 5s., *plus* exchange on cheques drawn on banks outside Melbourne, and must be paid to the Examination Secretary by September 4, 1958. The examination will be conducted in general surgery, and the special branches of ophthalmology, laryngo-otology, gynæcology and operative obstetrics, orthopædics, urology, neurosurgery, plastic surgery, thoracic surgery and pædiatric surgery.

At its meeting held on June 22 and 24, 1956, the Council decided that until December 31, 1958, Fellows of other Colleges with which the Royal Australasian College of Surgeons has reciprocity of primary examinations and who obtained their fellowship prior to January 1, 1950, may, at the discretion of the Council, be permitted to undergo a modified type of final examination. The conditions set out above regarding method of application for permission to present, date on which entries close, examination fee, etc., also apply to the temporary modified type of final examination. It is further stressed that this is the last occasion on which the temporary modified examination will be held.

Medical Practice.

NATIONAL HEALTH ACT.

THE following notice appeared in the *Commonwealth of Australia Gazette*, No. 39, of July 10, 1958.

NATIONAL HEALTH ACT, 1953-1957.

Notice Under Section 134A.

Notice is hereby given that the Medical Services Committee of Inquiry for the State of Western Australia, after investigation, having reported on the twenty-second day of May, 1958, concerning the conduct of Arthur Keith Neale, of Chapman Street, St. James Park, medical practitioner, in

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED JULY 5, 1958.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	1	6(5)	12(7)	1	2	..	..	..	22
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	6	..	..	..	5	..	11
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	1(1)	..	..	..	..	..	..	1
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	..	19(19)	..	2	..	..	..	1	22
Diphtheria	1	..	..	..	1(1)	..	..	..	2
Dysentery (Bacillary)	..	1	3	10(10)	2(2)	..	..	..	16
Encephalitis	..	1(1)	..	..	..	..	..	..	1
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	1	..	..	..	1
Infective Hepatitis	39(18)	16(9)	21(2)	1(1)	4(1)	5	..	..	86
Lead Poisoning	..	..	1(1)	..	..	..	..	..	1
Leprosy	..	..	1	..	..	..	..	..	1
Leptospirosis	..	..	6(1)	..	..	..	..	..	6
Malaria	..	..	..	..	..	..	1	..	1
Meningococcal Infection	..	5(2)	1(1)	..	1(1)	..	..	..	7
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	..	..	1	..	..	..	..	..	1
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	22(12)	..	1	31(51)	..	..	..	54
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	19(8)	35(22)	7(1)	2(1)	2(1)	2	..	1	68
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	1	1	..	..	..	..	..	2
Trachoma	..	..	..	..	3(2)	..	..	..	3
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	25(16)	19(14)	33(10)	18(14)	4(3)	..	5	..	104
Typhoid Fever	..	..	..	1(1)	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

relation to his authority under section eighty-eight of the National Health Act, 1953-1957, I, Donald Alastair Cameron, the Minister of State for Health, did on the 9th day of June, 1958, reprimand the said Arthur Keith Neale.

Dated this 9th day of June, 1958.

DONALD A. CAMERON,
Minister of State for Health.

POLICE OFFENCES (AMENDMENT) ACT, 1908.

THE following notice appeared in the *New South Wales Government Gazette*, No. 68, of July 11, 1958.

POLICE OFFENCES (AMENDMENT) ACT, 1908, AS AMENDED.

Withdrawal of Authority to be in Possession of Drugs.

It is hereby notified for general information that under the provisions of Regulation No. 25 of the Police Offences (Amendment) Act, 1908, as amended, the authority of Dr. John Frederick Marrington, of 49 Barker Road, Strathfield, to procure and be in possession of drugs to which the Police Offences (Amendment) Act applies for the purpose of his profession, and to issue prescriptions for such drugs, is withdrawn as on and from Monday, 28th July, 1958. (A.58-21.)

C. A. KELLY,
Chief Secretary.

Australian Medical Board Proceedings.

QUEENSLAND.

THE following have been registered, pursuant to the provisions of Section 19 (1) (*a*) and (*c*) of *The Medical Acts*, 1939 to 1955, of Queensland: Ganter, Arthur Errol, M.B., B.S., 1957 (Univ. Queensland); Gordon, David Oswald, M.B., B.S., 1955 (Univ. Melbourne).

The following have been registered, pursuant to the provisions of Section 19 (1) (*a*) and (*d*) of *The Medical Acts*, 1939 to 1955, of Queensland: McFadzean, Reginald Victor, M.B., B.S., 1947 (Univ. Sydney); McLean, Charles Mullen, M.B., Ch.B., 1939 (Univ. Glasgow), D.O.M.S., R.C.P., London, R.C.S., England, 1950; Yorkston, Neil James, M.B., B.S., 1952 (Univ. Sydney), M.R.A.C.P., 1956, D.T.M. and H., 1957 (Univ. Sydney); Abrahams, Mary Jean, M.B., B.S., 1944 (Univ. Melbourne); Spring, Edward Ernest Joseph, M.B., B.S., 1911 (Univ. Melbourne).

The following has been granted limited registration, pursuant to Section 20 (3) of *The Medical Acts*, 1939 to 1955, of Queensland: Adam, Bruce Douglas, M.B., B.S., 1958 (Univ. Sydney).

The following additional qualifications have been registered: Parker, Lawrence Septimus, F.R.C.S., Edinburgh, 1958; Macintosh, Laurel Jean, D.O., R.C.P., London, R.C.S., England, 1954.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Gibson, William Hector, M.B., B.S., 1951 (Univ. Sydney), 61 Howe Street, Lambton, New South Wales.

Rado, Tibor, M.D., 1918 (Univ. Budapest) (registered in accordance with the provisions of Section 17 (2*a*) of the *Medical Practitioners Act*, 1938-1957), 5 Rockwell Crescent, Potts Point, New South Wales.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Maloof, Clement Joseph, M.B., B.S., 1958 (Univ. Sydney); Anthony, Michael, M.B., B.S., 1957 (Univ. Sydney); Whiley, Warren, M.B., B.S., 1957 (Univ. Sydney); White, Kevin Hamilton, M.B., B.S., 1946 (Univ. Sydney); Harrison, Gordon Alfred, M.B., B.S., 1955 (Univ. Sydney); Renouf, Noel Arnold, M.B., B.S., 1956 (Univ. Sydney); Sztolcman, Hersz Wolf, M.D., 1940 (Univ. Naples) (registered in accordance with the provisions of Section 17 (1c) of the *Medical Practitioners Act*, 1938-1957).

Deaths.

THE following deaths have been announced:

HAWKE.—David William Hawke, on July 16, 1958, at Coff's Harbour, New South Wales.

HURLEY.—Thomas Ernest Victor Hurley, on July 17, 1958, at Melbourne.

Diary for the Month.

JULY 31.—South Australian Branch, B.M.A.: Scientific Meeting.
JULY 31.—New South Wales Branch, B.M.A.: Branch Meeting.
JULY 31.—New South Wales Branch, B.M.A.: Branch Meeting.
AUG. 1.—Queensland Branch, B.M.A.: General Meeting.
AUG. 5.—New South Wales Branch, B.M.A.: Organization and Science Committee.
AUG. 6.—Victorian Branch, B.M.A.: Branch Meeting.
AUG. 6.—Western Australian Branch, B.M.A.: Branch Council.
AUG. 7.—South Australian Branch, B.M.A.: Council Meeting.
AUG. 8.—Queensland Branch, B.M.A.: Council Meeting.
AUG. 8.—Tasmanian Branch, B.M.A.: Branch Council.
AUG. 12.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales. The Maitland Hospital.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2615-2-3.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this Journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in Australia can become subscribers to the Journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £5 *per annum* within Australia and the British Commonwealth of Nations, and £6 *per annum* within America and foreign countries, payable in advance.